VOLUME 33 NUMBER 11

The Journal

OF THE

AMERICAN DENTAL ASSOCIATION

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THE JOURNAL
of the
AMERICAN DENTAL ASSOCIATION

Vol. 33 JUNE 1, 1946 No. 11

THE BIOLOGICAL PRODUCTION AND THERAPEUTIC USE OF AMMONIA IN THE ORAL CAVITY IN RELATION TO DENTAL CARIES PREVENTION

Robert G. Kesel, D.D.S., M.S.; Joseph F. O'Donnell; Ernst R. Kirch, Ph.D., and Edward C. Wach, D.D.S., M.S., Chicago

Numerous studies on dental caries have reported the absence of certain aciduric bacteria, particularly Lactobacillus acidophilus, from the oral flora of persons who have no caries.[1-4] Opinions conflict as to whether or not these bacteria are responsible for caries production, but there is general acceptance of an association between caries activity and the presence or absence of these micro-organisms. There are a few persons who do not have these micro-organisms in their oral flora despite the fact that they consume carbohydrate foods and are exposed frequently to contamination by the bacteria.

T. J. Hill[5] has reported that Lactobacillus acidophilus placed in saliva collected from persons who were immune to dental caries was rendered nonviable in a few hours despite incubation at body temperature and the addition of glucose to the saliva to favor its growth. Attempts have been made to plant Lactobacilli in the mouths of caries-inactive persons by having them rinse their mouths with forty-eight hour broth cultures of these micro-organisms. The mouths were cultured at hourly intervals after inoculation and it was found that the number of viable Lactobacilli was rapidly reduced, these micro-organisms completely disappearing in nine to twelve hours.

From the University of Illinois, Department of Applied Materia Medica and Therapeutics, College of Dentistry, and Department of Chemistry, College of Pharmacy.

Prize-winning essay in the Fifth Annual Prize Essay Contest sponsored by the Chicago Dental Society.

1. Bunting, R. W., and Palmerlee, Faith: Role of Bacillus Acidophilus in Dental Caries. J.A.D.A. 12:381, April 1925.

2. Jay, Philip: Lactobacillus Acidophilus and Dental Caries. Am. J. Pub. Health 28: 759, June 1938.

3. Kesel, R. G.: Dental Caries: Etiology, Control and Activity Tests. J.A.D.A. 30:25, January 1, 1943.

4. Becks, Hermann; Jensen, A. L., and Millarr, C. B.: Rampant Dental Caries: Prevention and Prognosis. J.A.D.A. 31:1189, September 1, 1944.

5. Hill, T. J.: Salivary Factor Which Influences the Growth of L. Acidophilus and Is an Expression of Susceptibility or Resistance to Dental Caries. J.A.D.A. 26:239, February 1939.

Other experiments have shown that saliva from persons who have active caries has the power to convert glucose rapidly into acid whereas saliva from persons with no active caries does not. Procedures designed to test for caries activity have been developed based on these observations.[6, 7]

It appears that the oral environment in persons with no active caries either contains something that is inimical to the development of L. acidophilus and the fermentation of glucose or lacks some factor necessary for the growth of these bacteria and the degradation of carbohydrates. Preliminary investigation showed that as saliva stagnates there develops in it inhibitory properties for Lactobacilli and glucose fermentation. It was further found that cultures of caries-immune saliva growing in beef infusion broth at a pH of 7.6 developed greater inhibitory properties for Lactobacilli and glucose degradation than did saliva incubated by itself. The maximum inhibitory effect was demonstrated by cultures that were incubated for eight days.

The ability of the culture to prevent glucose fermentation and to eliminate Lactobacilli was determined as follows. The broth culture was filtered through a Seitz filter to stop bacterial action and to remove bacterial bodies and débris. The clear filtrate was then added in equal volume, usually 3 ml., to saliva freshly collected from a person having active dental caries. That saliva was known to contain large numbers of Lactobacilli and to rapidly degrade glucose. To this saliva-filtrate mixture, 1 ml. of a 2 per cent glucose solution was added to enhance the growth of Lactobacilli and to permit a determination of glucose conversion into acid. Before this mixture was placed in the incubator, 0.1 ml. was removed and spread over the surface of a tomato agar plate prepared according to Hadley's modification of Kulp's formula. This medium is the standard one for growing oral Lactobacilli.[8] A pH determination of the mixture also was obtained. Then the mixture was placed in the incubator. At the end of four, twenty-four and forty-eight hours, another pH reading was made, and at the end of twenty-four, forty-eight and seventy-two hours subcultures again were made on tomato agar medium. Controls were established by adding to the caries-active saliva similar amounts of glucose solution and sterile, uninoculated beef broth.

While cultures of saliva from caries-inactive subjects developed inhibitory properties, cultures from caries-active persons treated similarly did not. The contrast is shown by an example in Table 1. The mixture containing the filtrate from a caries-immune saliva did not change in pH over a forty-eight hour period whereas that from a caries-active saliva permitted a drop in pH to 4.2 in forty-eight hours.

In Figure 1 the bacterial inhibition is shown. The first plate shows the number of Lactobacilli and yeasts that devel-

Table 1.—Comparison Between Inhibiting and Noninhibiting Filtrates on Salivary Acid Production

	Inhibiting Filtrate	*Noninhibiting Filtrate*
	Saliva....3.0 ml. Filtrate...3.0 ml. 2% Glucose Solution. 1.0 ml.	Saliva....3.0 ml. Filtrate...3.0 ml. 2% Glucose Solution. 1.0 ml.
Time	pH	pH
Start.....	7.4	7.2
4 hours....	7.4	5.0
24 hours...	7.4	4.6
48 hours...	7.4	4.2

6. Fosdick, L. S.; Hansen, H. L., and Epple, Charlotte: Enamel Decalcification by Mouth Organisms and Dental Caries: A Suggested Test for Caries Susceptibility. J.A.D.A. 24: 1275, August 1937.

7. Wach, E. C., et al.: Testing Caries Activity by Acid Production in Saliva. J. D. Res. 22:415, October 1943.

8. Hadley, F. P., and Bunting, R. W.: Quantitative Method for Recognizing Bacillus Acidophilus in Saliva. J. D. Res. 13:198, June 1933.

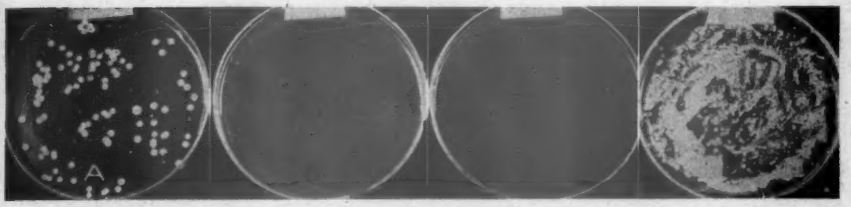

Fig. 1.—Bacterial inhibition by salivary filtrate: (A) 0 hour contact between filtrate, saliva and 2 per cent glucose solution. (B) Twenty-four hour contact between filtrate, saliva and 2 per cent glucose solution. (C) Forty-eight hour contact between filtrate, saliva and 2 per cent glucose solution. (D) Forty-eight hour contact between beef broth, saliva and 2 per cent glucose solution. All plates were incubated seventy-two hours.

oped on the surface of a tomato agar plate from 0.1 ml. of an inhibiting filtrate and saliva mixture transferred immediately after they were combined. The second plate gives the results after twenty-four hours of incubation. There is no growth; the aciduric organisms have disappeared. The third plate shows the result of forty-eight hours of contact; the aciduric organisms still are absent. The fourth plate shows the number of aciduric organisms present in 0.1 ml. of the control combination of beef broth, glucose solution and the same caries-active saliva after forty-eight hours of incubation. The aciduric organisms, yeasts and Lactobacilli, have not only remained viable in the control tube but also have increased. These results indicate that an inhibiting agent was present in the Seitz filtrate obtained from the culture of a caries-immune saliva.

Standardizing the Test for Filtrate Potency

It was recognized that the method originally employed to test the inhibiting power of the filtrate did not permit accurate comparative analyses because saliva collected from caries-active subjects on different days and from different persons varied in its content of Lactobacilli and in its ability to convert glucose into acid. Furthermore, this method of testing filtrates required the frequent collection of fresh saliva. Therefore, a method for testing filtrates was devised which would eliminate the necessity of collecting fresh saliva and would give a more uniform basis for the test. As the L. acidophilus was the bacterium whose inhibition we were interested in particularly, and as the Lactobacillus has the ability of rapidly converting glucose into acid and is probably in a large measure responsible for this action in the saliva of caries-active persons, a standard culture of that organism was used as the basis for testing. The Hadley strain, number 4646, Lactobacillus acidophilus was obtained from the American Type Culture Collection and was used as the standard test organism. We shall not take the time to describe the methods employed to develop a standardized basis for comparison, but it was found that a strongly inhibitory filtrate would destroy the Hadley strain of Lactobacillus when a twenty-four hour culture of that organism was added to the filtrate and incubated for twenty-four hours. The concentration of the culture in the filtrate was 1-100. Filtrates not as strong permitted some organisms to survive for twenty-four hours but eliminated them after seventy-two hours. Weak or impotent filtrates would not inhibit growth, and many more of the Lactobacilli were present at the end of seventy-two hours incubation than were present at the time of inoculation. Glucose was routinely added to the filtrate so that it would be

present in a 2 per cent concentration. The antibacterial and antienzymatic effectiveness of salivary and bacterial cultures was judged on this basis.

It was assumed that the inhibiting factor was produced by bacterial activity since it increased during the incubation period. Further study revealed that many types of bacteria were present in the cultures of immune saliva. There was one, Bacterium lactis aerogenes, consistently present. It was also one of the last survivors in eight days of incubation. The last surviving organism was usually a Staphylococcus, which was identified as Staphylococcus epidermidis according to Bergy's classification. On frequent occasions colonies of large gram-positive bacilli in chain formation would appear in the salivary cultures. They proved to be highly pleomorphic when subcultured and have not been identified.

In all, 105 different bacterial organisms were selected and grown for eight days in pure culture in meat infusion broth. The cultures then were passed through Seitz filters and the filtrates tested for their inhibiting ability by the above-described method. The only organism that produced an inhibiting filtrate was Bacterium lactis aerogenes. When this organism was cultivated in combination with the large gram-positive unidentified bacillus, the filtrate from the combined growth showed an increased inhibiting power. The gram-positive bacillus grown alone, however, produced no inhibition nor had it the ability to degrade glucose.

Effect of Filtrate Dilution

It was recognized that many antibiotic substances such as penicillin will maintain their effectiveness in high dilution, so experiments were performed to see how much the filtrates could be diluted before the inhibitory factor was rendered ineffective. Several filtrates which were known to be highly inhibitory were diluted with fresh beef infusion medium containing 2 per cent glucose. A 1-1 dilution was found usually to be effective in preventing the growth of L. acidophilus and a 1-2 dilution as a rule eliminated the organism after seventy-two hour contact between the diluted filtrate and the viable Lactobacilli, but no inhibition was evident in the higher dilutions. Figure 2 illustrates these results, establishing the fact that the inhibiting agent would not permit high dilution.

Effect of Concentrating Filtrate

If the inhibiting filtrates would not permit much dilution, what result would concentration have on them? Filtrates known to be potent inhibitors were used and a portion of each was always reserved as a control so that any variation in their potency could be checked by comparison. Some filtrates were evaporated to 50 per cent of their original volume, others to 60 and 75 per cent. Still others were evaporated to dryness and then the solids remaining were suspended in sufficient sterile beef infusion broth to produce 40 per cent of the original volume. Evaporation was accomplished in some by heat and in others in vacuum at room temperature. The filtrates that had been evaporated to dryness entirely lost their power to inhibit the growth of L. acidophilus and to prevent the conversion of glucose into acid. Those filtrates which had been evaporated to various volumes were found to have diminished in their potency in direct proportion to the extent of evaporation. The inhibitory activity of the filtrates was not increased by the concentration of their volume. Figure 3 shows the contrast between the inhibitory effect of two portions of the same filtrate, one of which was unaltered and the other evaporated to dryness in vacuum and the residue dissolved in beef infusion broth. Viable Lactobacilli were sown into each and tomato agar cultures were made after

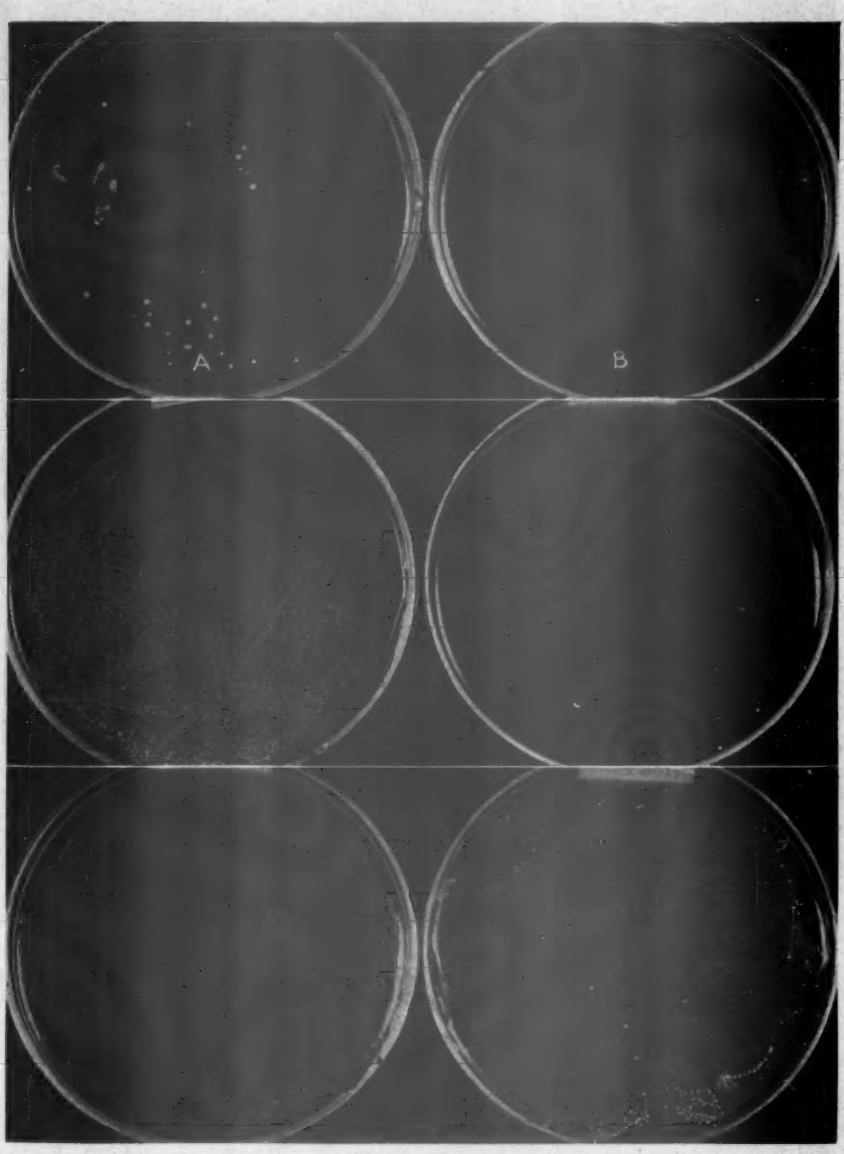

Fig. 2.—Effect of dilution upon inhibitory property of filtrates: Inhibitory filtrate diluted 1-1 with beef glucose broth after (A) twenty four hour contact and (B) seventy-two hour contact. Inhibitory filtrate diluted 1-2 with beef glucose broth after (C) twenty-four hour contact and (D) seventy-two hour contact. Inhibitory filtrate diluted 1-3 with beef glucose broth after (E) twenty-four hour contact and (F) seventy-two hour contact.

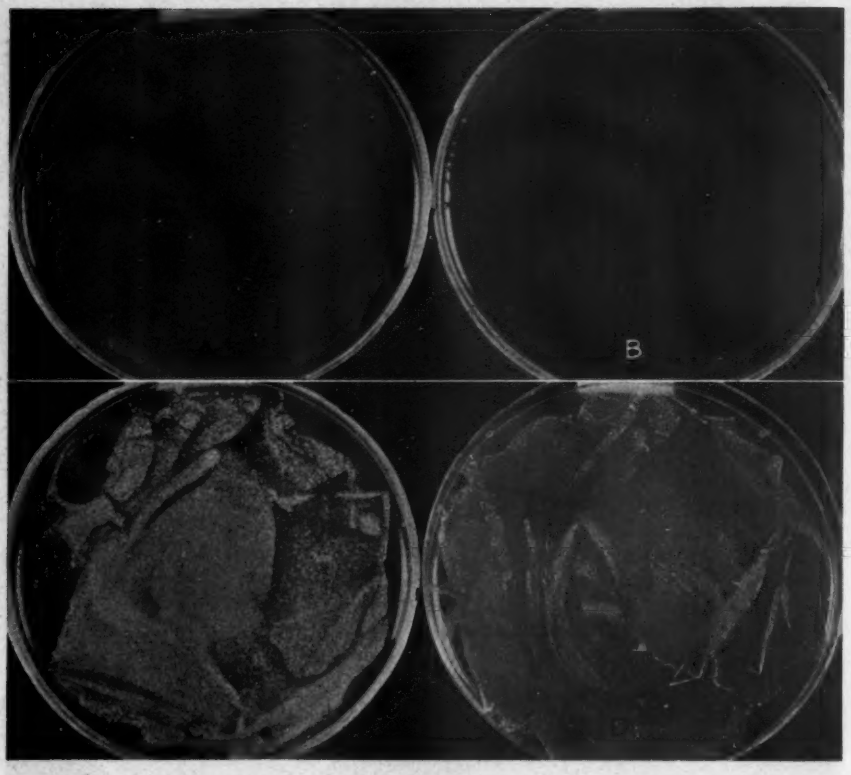

Fig. 3.—Effect of concentration on inhibitory filtrate: Inhibitory filtrate unaltered after (A) twenty-four hour contact and (B) seventy-two hour contact. Same filtrate evaporated to dryness and dissolved in beef glucose broth—40 per cent original volume—after (C) twenty-four hour contact and (D) seventy-two hour contact.

twenty-four and seventy-two hour contact. That which had been evaporated no longer possessed inhibiting qualities. This fact gave us the clue that the inhibiting agent was volatile and was being removed in the distillate.

The Inhibiting Agent

Inhibiting filtrates then were evaporated in vacuum at room temperature and tests were made on the distillate to determine what substances were present. The substance that was continually found in the distillate was ammonia nitrogen. With this clue all filtrates were examined directly for their ammonia nitrogen content, and a direct correlation was found between the amount of ammonia nitrogen present and the degree of inhibition which the filtrates exerted. The ammonia nitrogen determination was made by the Folin permutit method.[9] Noninhibiting filtrates contained little or no ammonia nitrogen; filtrates that were inhibitory contained at least 0.5 mg. of ammonia nitrogen per milliliter. Examples of the relation between the Lacto-

9. Hawk, P. B., and Bergeim, Olaf: Practical Physiological Chemistry. Ed. 10, revised. Philadelphia: P. Blakiston's Son & Co., 1931.

bacilli inhibiting properties of various filtrates and their ammonia nitrogen content are shown in Figure 4.

Then it was decided to add ammonia directly to the culture medium to determine the effect of such addition. Varying amounts of ammonium carbonate were added to tubes of sterile broth medium, and these combinations were tested for their Lactobacillus inhibitory potency by using the usual method. The inhibitory ability of these additions paralleled those of the salivary culture filtrates that had similar ammonia nitrogen concentrations. The results are demonstrated in Figure 5. This evidence substantiated the discovery that the inhibiting substance which developed in the saliva cultures was ammonia nitrogen, and ammonium carbonate was found to be the most effective salt in inhibiting the growth of Lactobacilli. Basic ammonium salts were found to be inhibitory whereas acid salts were not.

Ammonia or Alkalinity

There was the possibility that the alkalinity produced by the ammonia nitrogen was the inhibiting factor. A solution of ammonium acetate was prepared containing 5.6 mg. per milliliter. A solution of sodium acetate was prepared having the same pH—7.2. These solutions were added in varying amounts to separate test tubes of broth medium. These tubes were inoculated with Lactobacilli, and the effect of the two substances on the growth of the Lactobacilli was determined. The results are shown in Figure 6. There was abundant growth of Lactobacilli in the control culture which contained neither sodium nor ammonium acetate. The tubes to which ammonium and sodium acetate were added in the amount of 0.1 ml. produced no apparent inhibition of the bacteria, and similar results were obtained in the tubes to which 0.5 and 1.0 ml. of sodium acetate solution had been added. However, the tubes containing 0.5 and 1.0 ml. of the ammonium acetate solution showed complete inhibition of the Lactobacilli. The ammonia nitrogen and not the alkalinity produced the inhibitory effect at the pH of 7.2.

Grove and Grove[10] reported a slight increase of ammonia in the saliva of caries-immune persons over that present in caries-susceptible. Stephan[11] later recommended the use of synthetically prepared urea as a mouth rinse for the possible control of caries because of its conversion into ammonia by the enzyme urease present in the mouth. We found that urea was not the only source for ammonia nitrogen in our salivary cultures because the bacteria which we had found effective in producing ammonia nitrogen in the culture medium did not break down urea into ammonia nitrogen and the medium into which the organism was inoculated and in which it developed inhibiting powers was urea free.

Deamination of Amino Acids

It has been shown that the ammonia in urine results from the deamination of amino acids and not from the degradation of urea as has been thought for so long. Van Slyke and his associates[12] found that under no condition was it possible to demonstrate in the kidney a conversion of urea nitrogen to ammonia nitrogen. The amide of glutamic acid, glutamine, apparently serves as the precursor for the bulk of urinary ammonia. The possibility exists that ammonia nitrogen production in the mouth may result from the deamination of certain

10. Grove, C. T., and Grove, C. J.: Biochemical Aspect of Dental Caries. D. Cosmos 76:1029, October 1934.

11. Stephan, R. M.: Two Factors of Possible Importance in Relation to Etiology and Treatment of Dental Caries and Other Dental Diseases. Science 92:578, December 20, 1940.

12. Van Slyke, D. D., et al.: Glutamine as Source Material of Urinary Ammonia. J. Biol. Chem. 150:481, October 1943.

Fig. 4.—Correlation between ammonia nitrogen content and inhibitory properties of filtrates: Control plate with beef glucose broth, no ammonia nitrogen present, after (A) twenty-four hour contact and (B) seventy-two hour contact. No. 1 filtrate, ammonia nitrogen content 0.06 mg., after (C) twenty-four hour contact and (D) seventy-two hour contact. No. 2 filtrate, ammonia nitrogen content 0.218 mg., after (E) twenty-four hour contact and (F) seventy-two hour contact.

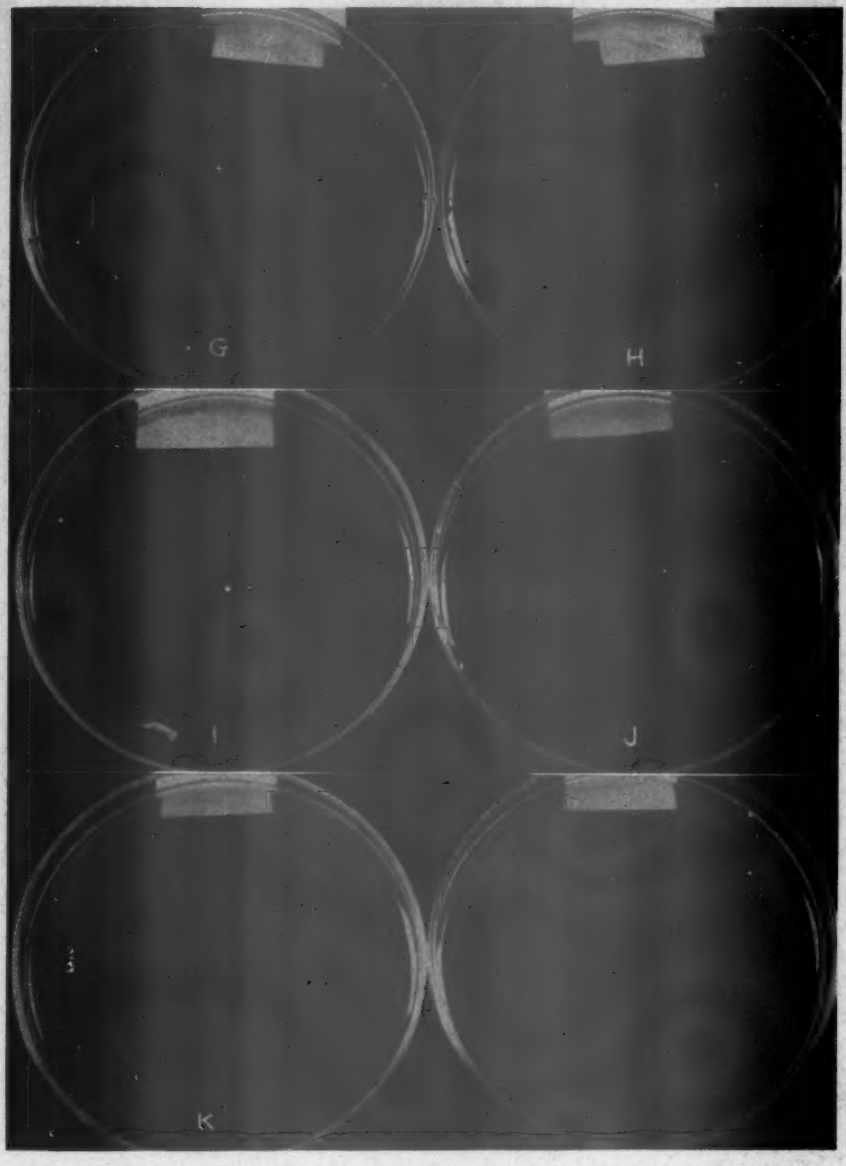

Fig. 4 (continued).—No. 3 filtrate, ammonia nitrogen content 0.504 mg., after (G) twenty-four hour contact and (H) seventy-two hour contact. No. 4 filtrate, ammonia nitrogen content 0.624 mg., after (I) twenty-four hour contact and (J) seventy-two hour contact. No. 5 filtrate, ammonia nitrogen content 1.476 mg., after (K) twenty-four hour contact and (L) seventy-two hour contact.

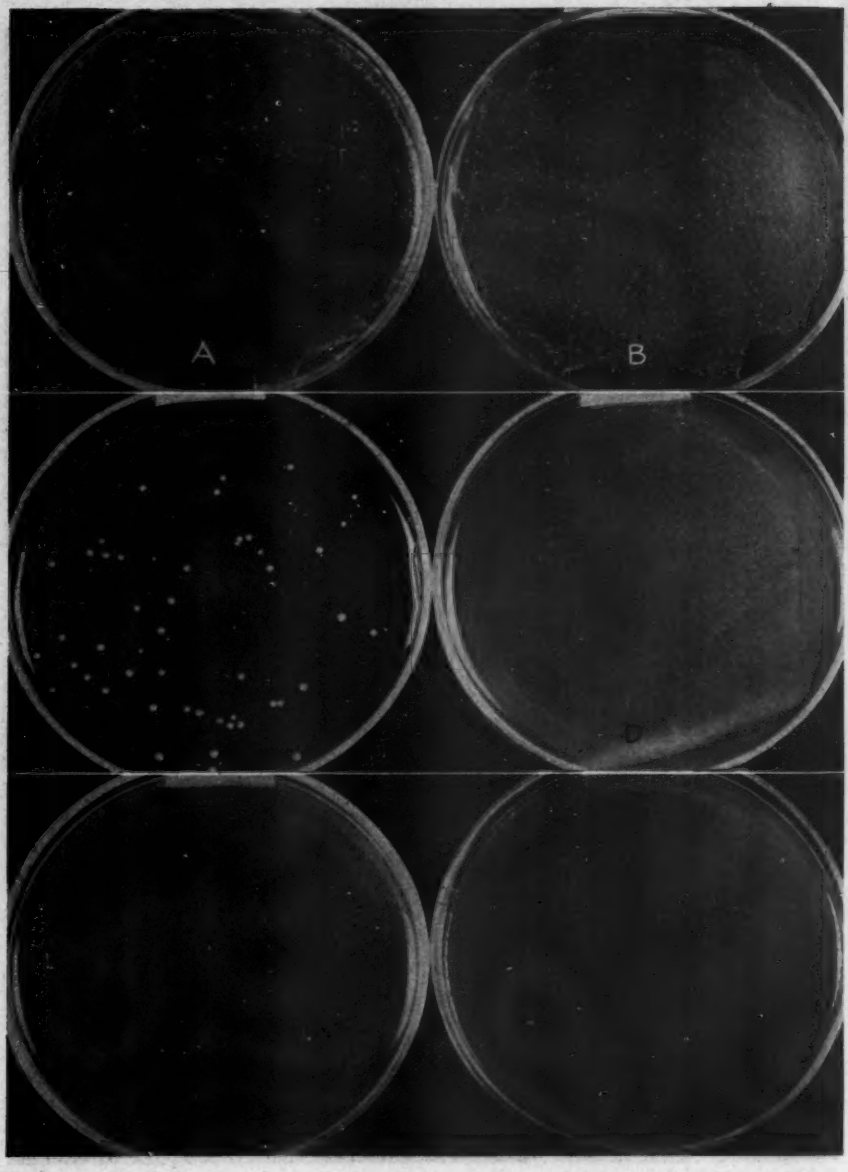

Fig. 5.—Effect of measured amount of ammonium carbonate on the growth of L. acidophilus: Control plate with beef glucose medium, no ammonium carbonate, after (A) twenty-four hour contact and (B) seventy-two hour contact. Beef glucose medium containing 0.1 ml. ammonium carbonate solution (solution contained 5.6 mg. ammonium carbonate per milliliter) after (C) twenty-four hour contact and (D) seventy-two hour contact. Beef glucose medium containing 0.2 ml. ammonium carbonate solution after (E) twenty-four hour contact and (F) seventy-two hour contact.

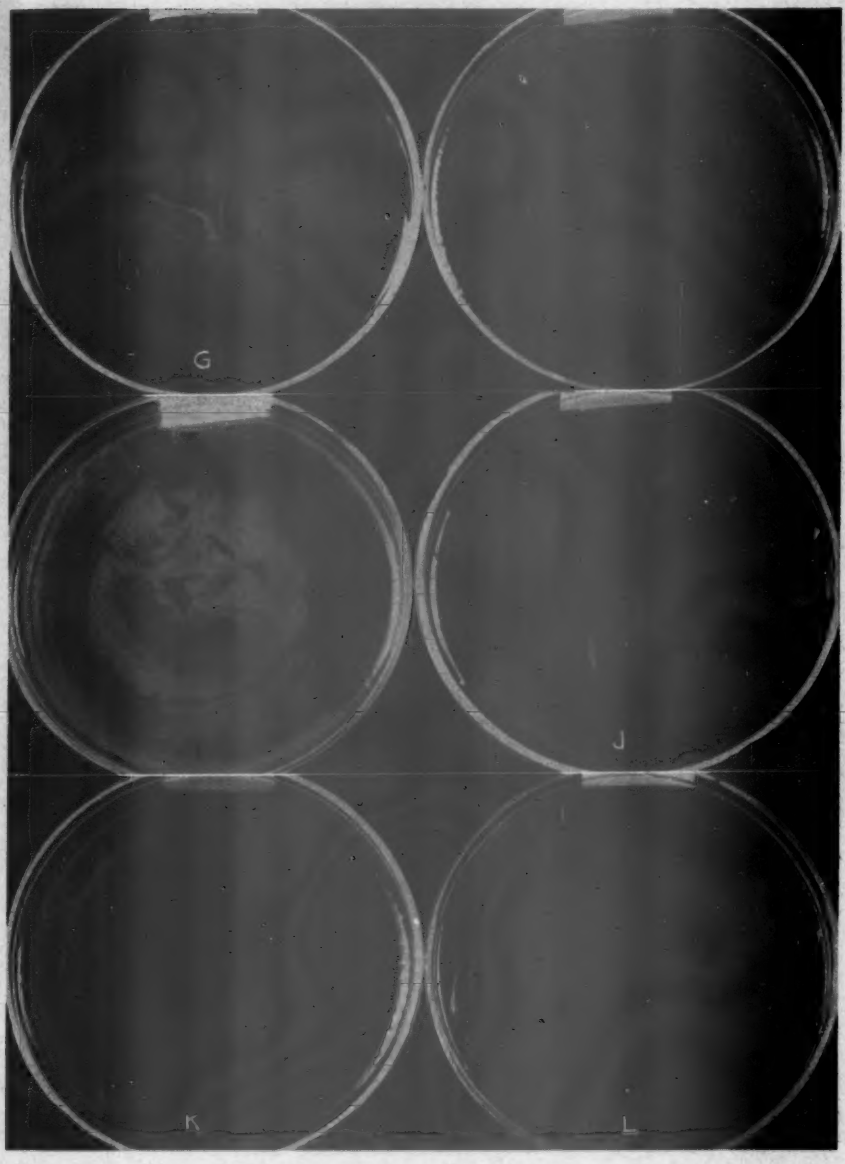

Fig. 5 (continued).—Beef glucose medium containing 0.3 ml. ammonium carbonate solution after (G) twenty-four hour contact and (H) seventy-two hour contact. Beef glucose medium containing 0.4 ml. ammonium carbonate solution after (I) twenty-four hour contact and (J) seventy-two hour contact. Beef glucose medium containing 0.5 ml. ammonium carbonate solution after (K) twenty-four hour contact and (L) seventy-two hour contact.

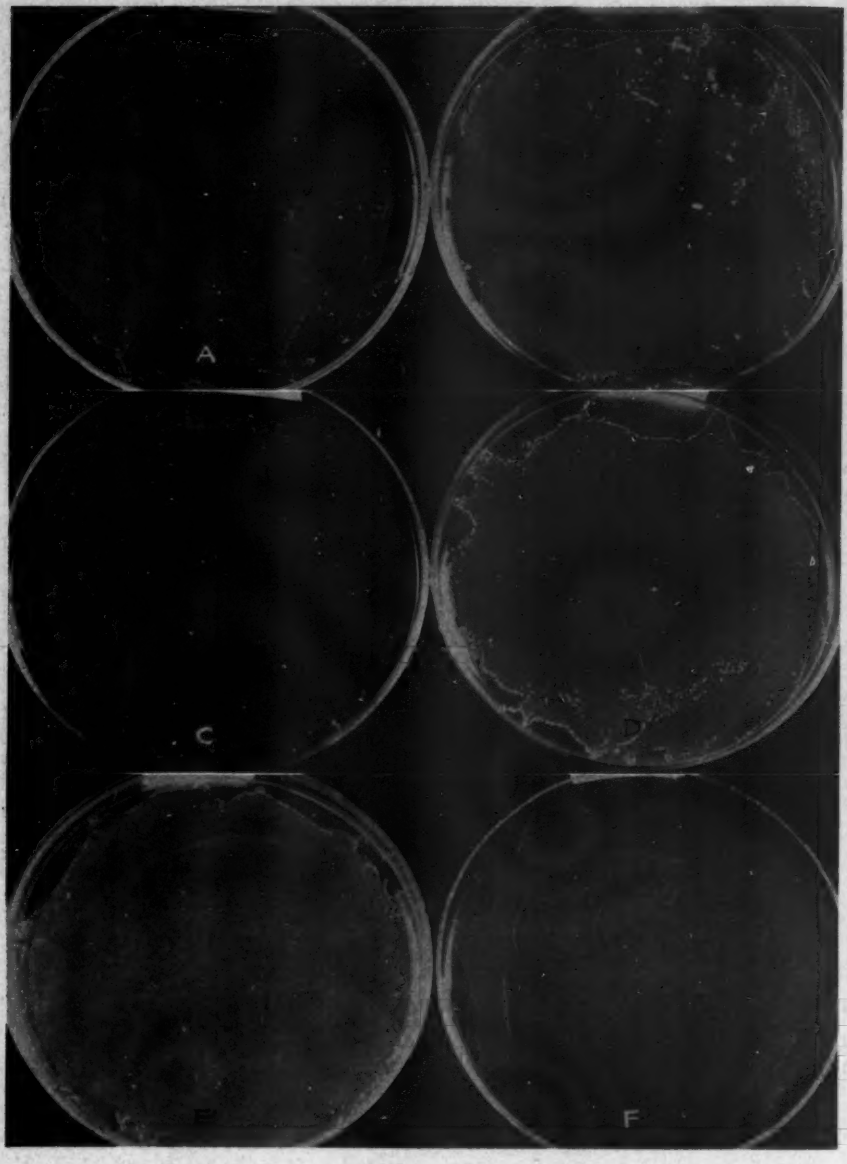

Fig. 6.—Effect of alkalinity on the inhibition of L. acidophilus: Control plate with beef glucose broth after (A) twenty-four hour growth and (B) seventy-two hour growth. No. 1 culture with beef glucose broth and 0.1 ml. ammonium acetate solution after (C) twenty-four hour contact and (D) seventy-two hour contact. No. 2 culture with beef glucose broth and 0.1 ml. sodium acetate solution after (E) twenty-four hour contact and (F) seventy-two hour contact.

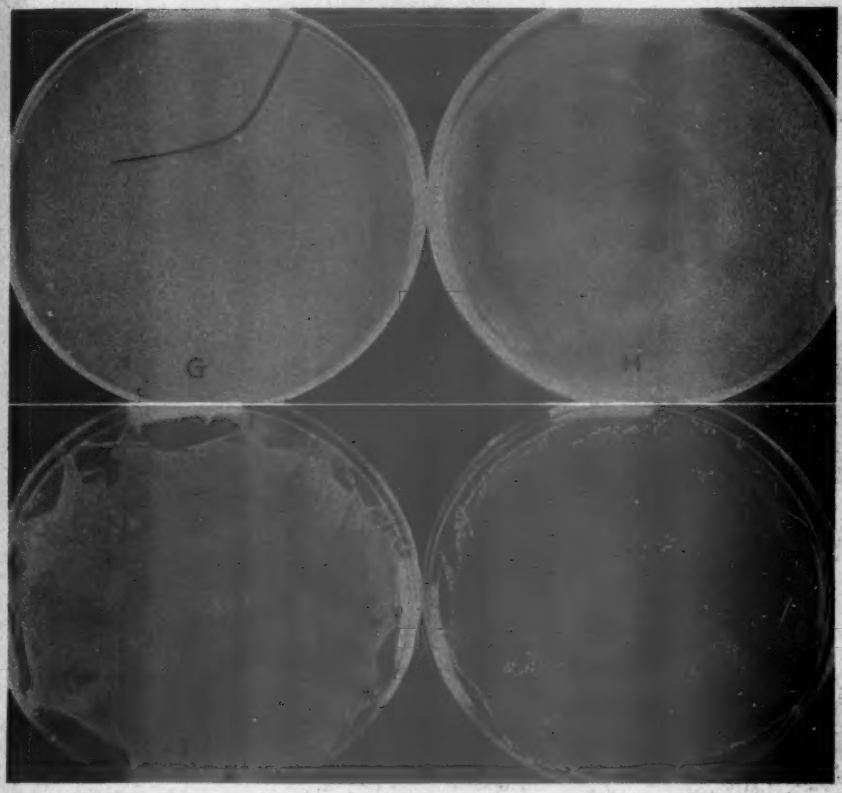

Fig. 6 (continued).—No. 3 culture with beef glucose broth and 0.5 ml. ammonium acetate solution after (G) twenty-four hour contact and (H) seventy-two hour contact. No. 4 culture with beef glucose broth and 0.5 ml. sodium acetate solution after (I) twenty-four hour contact and (J) seventy-two hour contact.

amino acids which are present in saliva as well as from the conversion of urea.

Information concerning the content of amino acids in saliva at the present time is very limited. That our knowledge is incomplete may be explained in part by the lack of analytic procedures by which the amino acid content of body organs and fluids can be measured conveniently and accurately. Microbiologic methods for the estimation of several of the amino acids have been recently described.[13-17] These new approaches afford easier and simpler procedures and are more important where satisfactory chemical methods are not available.

13. Shankman, S.; Dunn, M., and Rubin, L. B.: Analysis of 8 Amino Acids by Microbiological Method. J. Biol. Chem. 151:477, October 1943.

14. Kuiken, K. A., et al.: Microbiological Determination of Amino Acids: Valine, Leucine and Isoleucine. J. Biol. Chem. 151:615, December 1943.

15. Baumgarten, W., et al.: A Medium for Obtaining Maximal Growth Response in Microbiological Assays of Amino Acids. J. Am. Chem. Soc. 66:1607, September 1944.

16. MacMahan, J. R., and Snell, E. E.: Microbiological Determination of Amino Acids. J. Biol. Chem. 152:83, February 1944.

17. Stokes, J. L., and Gunness, M.: Microbiological Methods for the Determination of Amino Acids. J. Biol. Chem. 157:651, February 1945.

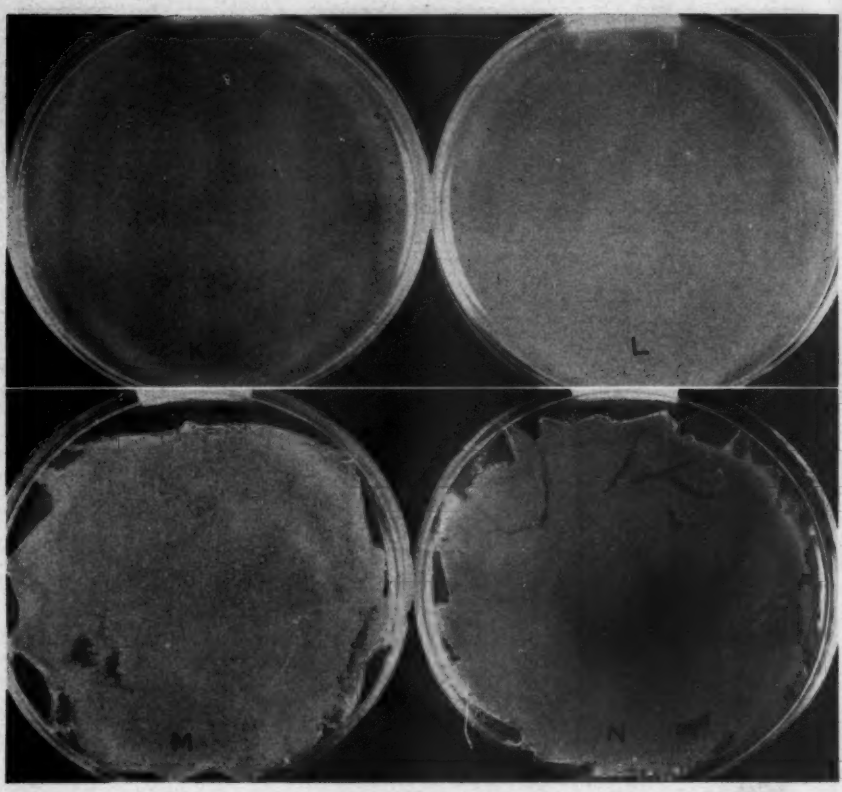

Fig. 6 (continued).—No. 5 culture with beef glucose broth and 1.0 ml. ammonium acetate solution after (K) twenty-four hour contact and (L) seventy-two hour contact. No. 6 culture with beef glucose broth and 1.0 ml. sodium acetate solution after (M) twenty-four hour contact and (N) seventy-two hour contact.

The presence of enzyme systems in the saliva capable of deaminating several amino acids has been previously reported.[18] In this paper values for the tryptophane, glutamic acid, isoleucine, arginine, serine and valine content of human saliva are reported.

Experimental Procedure

A three-minute paraffin-stimulated sample of saliva was collected two hours after the morning meal. (This freed the mouth of any accumulated débris and provided a sample of saliva for the L. acidophilus count.) After this about 40 ml. of saliva was collected in a sterile container. This second portion of saliva was autoclaved immediately at fifteen pounds pressure for fifteen minutes and then was stored in the refrigerator until used. In every case the specimen was assayed within twenty-four hours, because preliminary results indicated that variations in the amino acid content occurred if a specimen was kept for a longer period.

18. Kesel, R. G.; O'Donnell, J. F., and Kirch, E. R.: Deamination of Amino Acids by Human Oral Flora: Its Role in Dental Caries Immunity. Science 101:230, March 2, 1945.

Table 2.—Amino Acid Content of Human Saliva

Subject	Caries Activity	Mg. Per Cent of Amino Acid					
		Glutamic Acid	Trypto-phane	Arginine	Isoleucine	Serine	Valine
1	I*	4.0	0.32	5.2	6.0	40.5	1.15
2	I	6.5	0.48	3.3	5.5	40.2	1.0
3	I	8.0	0.23	4.0	3.5	17.0	1.3
4	I	8.0	0.35	8.6	8.2	59.5	1.6
5	I	7.5	0.35	4.4	4.5	41.0	1.1
6	I	7.8	0.48	7.3	6.5	37.5	0.8
7	M.A.†	6.0	0.34	5.0	5.0	25.0	1.3
8	M.A.	12.5	0.90	.....	3.6—	6.0	0.7
9	M.A.	3.0	0.20	4.2	2.6	28.0	1.2
10	M.A.	5.5	0.28	5.7	5.2	11.5	0.7
11	M.A.	5.0	0.36	4.5	7.2	46.0	1.2
12	M.A.	4.5	0.30	7.0	4.2	22.5	2.2
13	M.A.	5.0	0.35	6.3	5.7	57.5	1.3
14	V.A.‡	12.5	0.30	10.0	10.2	33.5	1.0
15	V.A.	7.5	0.31	9.0	8.0	82.0	2.2
16	V.A.	5.0	0.55	7.2	6.0	24.0	1.6
17	V.A.	8.5	0.12	4.0	7.5	49.0	0.9
18	V.A.	4.2	0.31	4.6	7.2	21.0	0.8

*I—Caries inactive.
†M.A.—Caries moderately active.
‡V.A.—Caries very active.

Sterility tests were carried out on each sample after autoclaving. Fresh saliva samples were collected for each amino acid assay following the procedure described above.

Eighteen university staff members and dental students were used. They were classified as caries inactive, moderately active and very active as determined by roentgenographic, clinical and laboratory data. L. acidophilus counts (Hadley) were made on every specimen.

The following divisions were set up:

Caries inactive: No occurrence of carious lesions during the preceding five years. L. acidophilus counts negative throughout the investigations.

Moderately active: X-ray and clinical findings of one to three lesions or recent fillings and L. acidophilus counts up to 50,000 per milliliter of saliva.

Very active: X-ray and clinical findings of four or more lesions or recent fillings and L. acidophilus counts over 50,000 per milliliter of saliva.

The group classified as follows: caries inactive, 6; caries moderately active, 7; caries very active, 5. No special diets were given.

For the assays of the amino acids, the pH of the saliva was adjusted to 6.8 and the saliva was then diluted with distilled water. For the assay proper, a particular strain of a test organism (L. casei, L. arabinosus, L. delbruckii) is inoculated into a special medium contained in a series of tubes, each tube containing increasing amounts of the amino acid under test as the sole limiting growth factor. After seventy-two hours of incubation, the growth response is measured by titrating the lactic acid formed with 0.1 N sodium hydroxide. A curve is obtained by plotting the number of milliliters of the 0.1 N sodium hydroxide obtained at each level of the amino acid

tested. The amino acid content of the unknown specimens is readily determined by interpolation of the standard curve. Duplicate tubes are used at each level of the amino acid standard and unknown. Several aliquots of the saliva dilutions were assayed to represent at least three levels on the standard curves. Figure 7 shows a typical standard curve for glutamic acid.

Tryptophane and glutamic acid were determined by the method of Baumgarten *et al.*,[15] isoleucine by the method of Kuiken *et al.*,[14] serine by the method of Stokes and Gunness[17] and Shankman, Dunn and Rubin,[18] and valine and arginine by the method of MacMahan and Snell.[16] The experimental data and values calculated from the assays are given in Table 2. All values are expressed in terms of l-amino acids.

Discussion

The presence of at least six amino acids in saliva has been demonstrated. The values for tryptophane ranged from 0.20 to 0.90 mg. per cent, for glutamic acid from 3.0 to 12.5 mg. per cent, for arginine from 4.2 to 10.0 mg. per cent, for isoleucine from 2.6 to 10.2 mg. per cent, for serine from 6.0 to 59.5 mg. per cent and for valine from 0.7 to 2.2 mg. per cent. These variations occurred irrespective of caries activity. (See Table 3.)

In two cases (one caries-free and one caries-active) salivas were assayed for tryptophane and glutamic acid using samples collected at various times during a twenty-four hour period. The tryptophane content varied from 0.175 to 0.325 per cent for the immune and from 0.5 to 1.35 per cent for the active. For glutamic acid the values ranged from 4.0 to 8.2 mg. per cent for the caries-inactive and from 11.5 to 23.0 mg. per cent for the caries-active. In both cases the lowest value was observed for the afternoon samples and the highest for the early morning samples. These variations are shown in Table 4.

For reasons of expediency, it was decided to collect all samples of saliva two hours after breakfast. It had also been found that this particular sample represented more of an average sample as far as the amino acid content is concerned. The variations from person to person which we have found may be due to differences in the diet as well as to differences in metabolic rates.

A positive correlation between the extent of dental caries and the rate of hydrolysis of starch has been reported.[19] It has further been suggested that tryptophane may be of value in increasing the time of this hydrolysis.[20] There are other very important differences in the salivas of caries-free and caries-active persons, such as the power to ferment glucose and the L. acidophilus count. In vitro experiments carried out by us

19. Turner, N. C., and Crane, E. M.: Relationship Between Dental Caries and Saliva. J. D. Res. 23:413, December 1944.

20. Turner, N. C.: Tryptophane as a Preventive for Caries. J. School Health, March 1945, p. 1.

Table 3.—Variation in the Amino Acid Content of Human Saliva

Caries Activity	Number of Cases	Mg. Per Cent of Amino Acids					
		Tryptophane	Arginine	Isoleucine	Serine	Valine	Glutamic Acid
Inactive	6	0.23-0.48	3.3-8.6	3.5-8.2	17.0-59.5	1.0-1.6	4.0-8.0
Moderately active	7	0.2-0.9	4.2-7.0	2.6-7.2	6.0-57.5	0.7-2.2	3.0-12.5
Very active	5	0.12-0.55	5.0-10.0	6.0-10.2	21.0-82.0	0.9-2.2	5.0-12.5

Table 4.—Variation in Tryptophane and Glutamic Acid Content of Saliva During a Twenty-Four Hour Period

Samples Collected	Mg. Per Cent of the Amino Acid			
	Subject A Immune		Subject B Caries Active	
	Glutamic Acid	Trypto-phane	Glutamic Acid	Trypto-phane
7 a.m.	8.2	0.325	23.0	1.35
10 a.m.	5.0	0.225	14.0	0.575
3 p.m.	4.0	0.175	11.5	0.50
9 p.m.	6.5	0.20	20.5	0.60

Table 5.—Control Group: Effects on Lactobacilli Counts of Five Months of Clinical Usage of Mouth Rinse and Dentifrices Containing No Ammonia

Subject	A	B	Subject	A	B
1	249,000	234,000	6	485,000	365,000
2	810,000	870,000	7	200,000	412,000
3	200,000	155,000	8	550,000	330,000
4	73,000	121,500	9	400,000	415,000
5	110,000	128,500	10	295,000	325,000

did not show any inhibitory action of tryptophane in concentrations up to 30 mg. per cent as far as glucose degradation and the growth of L. acidophilus are concerned.

Clinical Use of Ammonia

It was decided, on the basis of growing experimental evidence, to determine what effect the introduction of ammonia into the mouths of caries-active patients would have on the Lactobacilli counts. To this end the following experiment was undertaken.

Patients from the dental clinic and all first-, second- and third-year dental students who had a large number of carious lesions were tested for caries activity by the usual procedures previously described. A L. acidophilus count of 75,000 per milliliter was arbitrarily chosen as an index of high caries activity, and fifty-five subjects were chosen with this or higher counts. Confirmatory tests were performed on four consecutive days to make sure that the high counts were consistent.

The selected group was divided into two sections: one a control group and the other an experimental group. The ammonium salt to be tested was incorporated in a mouth wash and a tooth powder. A control mouth wash and dentifrice also were prepared which had the same content as the test preparations except that they did not contain ammonia. The control group was instructed to use the control mouth wash and powder and the second group to use the ammonia mouth wash and powder. The subjects were asked to return every week and submit saliva for a Lactobacilli count.

Choice of Ammonia Salt

In choosing an ammonium salt to act as the source of ammonia nitrogen, we first considered ammonium carbonate, but because of its high volatility it was feared that a mouth wash containing this salt soon would lose its effectiveness. Therefore, a more stable source of ammonia was sought.

The beef infusion broth used in our original studies that produced the greatest inhibitory qualities when inoculated with immune saliva was buffered with alkaline phosphates. In this respect it differed from ordinary broth. It might be assumed, therefore, that the ammonia combines with the phosphates to give additional inhibitory powers to the filtrate. Also, it was observed that the broth filtrates showed no evidence of an ammonia odor.

The ammonium salt which satisfied both of these specifications, that is, no odor and the presence of a phosphate radical, was dibasic ammonium phosphate. While it is recognized that small quantities of dibasic ammonium phosphate stimulate acidogenic bacterial activity, we found this salt to be inhibitory

Table 6.—Test Group: Effects on Lactobacilli Counts of Five Months of Clinical Usage of a Mouth Rinse and Dentifrice Containing Ammonia

Subject	A	B	Subject	A	B
11	698,000	40,000	34	540,500	70,000
*12	450,000	523,000	35	1,250,000	16,000
13	202,000	75,000	36	1,500,000	320,000
14	410,000	81,000	37	370,000	110,000
15	561,000	No Growth	38	260,000	No Growth
16	509,000	74,000	39	145,000	25,000
17	1,400,000	58,500	40	495,000	160,000
18	148,000	42,000	41	525,000	10,000
19	1,500,000	19,000	42	265,000	No Growth
20	338,000	140,000	43	73,000	No Growth
21	562,000	110,000	44	110,000	35,500
22	150,000	10,000	45	280,000	6,500
23	51,000	1,200	46	1,100,000	110,000
24	269,000	16,500	47	750,500	210,000
25	675,000	No Growth	48	820,000	2,500
26	375,000	42,000	49	900,000	160,000
27	260,000	30,000	50	585,000	No Growth
28	1,450,000	160,000	51	294,000	70,000
29	610,000	33,500	52	160,500	250
30	300,000	1,000	53	485,000	No Growth
31	165,000	40,000	54	315,000	90,000
32	470,000	30,000	55	755,000	20,500
33	900,000	145,000			

*This subject was uncooperative.

in the amount prescribed below. The test rinse and powder were made according to the following formulas:

Rinse:

	Gm. or cc.
Dibasic ammonium phosphate	50.0
Glycerin	100.0
Liquor amaranthi (U. S. P.)	10.0
Aqua menthae piperitae...q.s.	1,000.0

Powder:

Bentonite	50.0
Soluble saccharin	2.0
Oil of peppermint	4.0
Oil of cinnamon	2.0
Methyl salicylate	8.0
Dibasic ammonium phosphate	50.0
Precipitated calcium carbonate	884.0

The control preparations differed from the test preparations only in the fact that no dibasic ammonium phosphate was added to them. Instead an equal amount of precipitated calcium carbonate was added to the powder and aqua menthae piperitae to the rinse, in order to maintain the same volumes for the solution and the dentifrice.

Instructions to Patients

The patients were instructed to brush their teeth thoroughly with the tooth powder and then to use about one tablespoonful of the mouth rinse and to move it vigorously over the entire mouth for two to three minutes. They were to do this on arising and before retiring for the night, and they were also asked not to rinse the mouth with water after using the mouth rinse. No dietary or other instructions were given.

Experimental Results

The experimental findings have been arranged in Tables 5 and 6. The bacterial counts for Lactobacilli in the saliva of each subject before the experiment commenced are shown in column A. These numbers are the average of sal-

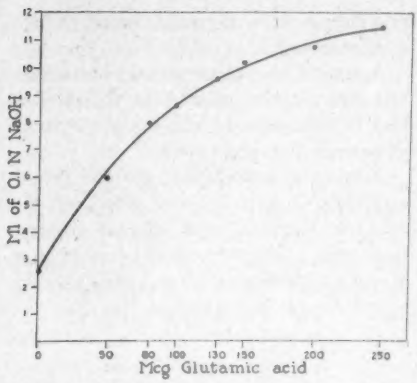

Fig. 7.—Typical standard curve obtained with l-glutamic acid.

ivary counts made on four consecutive days. The salivas were collected and were analyzed according to the Hadley method. The numbers in column B are the average of the last two Lactobacilli counts made in the same manner from the same persons after approximately five months' use of the rinse and dentifrice.

In every instance except one, the Lactobacilli counts were markedly reduced in the group using the ammonia preparations, whereas an increase or only a slight decrease was observed in the control group. Despite the apparent huge reduction in the counts in most cases, it is evident that some of the counts remained relatively high. The short length of time that the ammonia rinse and dentifrice have been used permits no observation of the clinical effect on dental caries. However, careful clinical examination of the subjects revealed no signs of gingival irritation and the oral mucosa appeared normal. The oral cavity, according to the patients, "felt exceptionally clean," and the teeth were notably free from materia alba and bacterial plaques.

In some of the subjects, Bacterium lactis aerogenes made its appearance in the salivary cultures. Its presence suggests the possibility of a gradual conversion of the oral flora from the type associated with caries activity to that with caries inactivity through the use of ammonia preparations in practicing oral hygiene.

Summary

1. We have established that cultures of human saliva collected from persons having no dental caries develop during an eight-day incubation period the ability to inhibit the growth of L. acidophilus and the conversion of glucose into acid because of the ammonia nitrogen produced.

2. The Bacterium found in the oral flora which is consistently present in these incubated salivas and which seems to be responsible for much of the ammonia nitrogen production is Bacterium lactis aerogenes. A synergistic action between Bacterium aerogenes and an unidentified gram-positive bacillus in increasing ammonia nitrogen production has been shown.

3. The inhibition of Lactobacillus acidophilus is not due to any alkalinity developed by the ammonia, for the same alkalinity provided by sodium acetate did not prevent the inhibition that ammonium acetate did.

4. The source of the ammonia nitrogen is not entirely urea; amino acids in saliva contributed to its formation.

5. At least six amino acids have been shown to be present in human saliva by using microbiologic procedures.

6. Values are reported for these acids in the saliva of three groups classified according to caries activity.

7. There is as yet no apparent correlation between the amount of these substances present in the saliva and caries activity.

8. Dibasic ammonium phosphate used clinically as a mouth rinse and dentifrice for approximately five months in caries-active persons produced a marked reduc-

tion in the salivary Lactobacilli counts.

Conclusions

The development of ammonia nitrogen in the oral cavity may be responsible for the absence of dental caries which some persons naturally exhibit. It may not need to be formed in the mouth in large quantities but, if it is produced by natural methods in small continuous quantities at the strategic points on the teeth where cavities develop, it may be effective in preventing the decalcification of the tooth substance.

Amino acids are present in human saliva and may be utilized for the production of ammonia by the enzyme systems present in the oral cavity.

Ammonia introduced into the mouth artificially has a limiting effect on the aciduric bacteria, and clinical observation over a longer period of time may reveal a reducing effect on caries activity. —*808 South Wood Street.*

A SYSTEM OF DENTAL IDENTIFICATION

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The tomb of the Unknown Soldier symbolizes much more than we usually think. To thousands of mothers and wives who have lost sons and husbands in war, their bodies never identified, the Unknown Soldier is a symbol of each son and of each husband. On Memorial Day our statesmen and our military leaders place wreaths on the tomb of the Unknown Soldier in homage to those soldiers who have died unknown.

The War Department recently announced that the graves of 274,000 United States soldiers killed overseas must be located and the bodies identified and registered to be sent home for burial. The war has precipitated us into the most gigantic problem of identification we have ever faced.

Unfortunately, we do not have a tomb of the Unknown Civilian to symbolize those who have died in civilian life unknown and unidentified, but there are many such tragic deaths every year.

Should the dental profession be able to supplement the use of fingerprinting with an additional method of identification which would be systematic and positive, it would be performing another of its important services to the public. Through the help of dentists, perhaps there would be no more unknown military or civilian deaths and no more unknown victims of amnesia. It is the purpose of this paper to propose a method whereby teeth and their characteristics may provide such a systematic and positive means of identification.

Historical Considerations

Teeth have been recognized as a means of identification of the unknown dead. B. H. Humble remarks: "Scattered throughout dental and medicolegal literature are many isolated cases where teeth have been the means of proving identity."[1] Professor Sprawson of England, in listing "Forensic Aspects

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Jour. A.D.A., Vol. 33, June 1, 1946

1. Humble, B. H.: Identification by Means of Teeth. Eighth Congrès Dentaire International, 1931, Sec. 16, p. 78.

of the Teeth and Jaws," says, "That there are cases where the identity of an individual has been established from evidence akin to the foregoing is true in Australia, the United States and, I believe, in this country, but at present the subject is in its infancy."[2]

Humble's essay is the most complete survey of such cases of identification which has been published to date. He lists two methods whereby "identity has been proved conclusively by dental means": "1. Where a body has been identified by teeth either natural or artificial. 2. Where identification has been made by tooth marks."[3] He then proceeds to list cases in which identity has been proved by each method.

Essentially, as Humble says in the statement quoted above, these cases are "isolated." They are also dependent upon coincidence, in a real sense. In the method of identification by tooth marks, used most frequently in criminal cases, the coincidence must be that the criminal was the rather unusual one who would bite his victim, and that the appropriate suspect should be available for matching of tooth marks with characteristics of his teeth. In the method of identification by teeth, the coincidence must be that, once the dental characteristics of the person or body are found, the dentist who performed the dental work should already be known or should happen to read the description and to remember this particular work. In the one method, in other words, the criminal suspect needs already to have been apprehended before identification is made, and, in the other method, the appropriate dentist must be found and consulted. The fact that the Federal Bureau of Investigation, other police agencies and private persons publish descriptions of dental characteristics[4] attests both that the use of teeth for identification is valuable and that at present the only hope for identification in many cases is the possibility that the appropriate dentist may read the description and recall some aspect of the work. Indeed, the hope for identification in these cases can be only vague and casual.

A particularly informative case occurred in Vermont and was reported by Rogers.[5] On May 16, 1935, three skeletons were found in a shallow grave near East Middlebury, Vt. Burial had been four to six years previous to discovery. Each had been shot through the head with a .38 caliber automatic pistol. One skeleton was of a woman, another of a 13-year-old boy and the other of an 11-year-old child of undetermined sex. The woman, presumably the mother, had had considerable dental work. This work was described in the report by several dentists, the detailed description indicating approximate dates of the work, methods used in the work and materials used. The older of the two children had orthodontic appliances on both the maxillary and the mandibular arches. The description of these appliances indicated the careful technic used in the appliances, the trade name of the appliance adjusted to the maxillary arch, together with reinforcements applied, and the unusual methods in the operator's technic. Even with these complete descriptions and unusual factors, identification of the skeletons has not been publicly indicated.

Before we turn to the conclusion of this study of the history of forensic dentistry, it should be remarked that characteristics of teeth are valuable not only for identification. Sprawson, in the study already mentioned, indicates the means

2. Sprawson, Evelyn: Forensic Aspects of the Teeth and Jaws. Proc. Roy. Soc. Med. 34:1, November 1940.

3. Humble, op. cit., p. 78.

4. For typical examples in one year, see J.A.D.A. 27:819, May 1940; 1163, July 1940; 1687, October 1940; 1847, November 1940.

5. Rogers, A. P.: Identification by Dental Means. J.A.D.A. 23:181, February 1936.

by which teeth may also be used to determine age and, frequently, habits and occupation. Another valuable contribution to the subject has been made by Brekhus in a statistical study of the incidence of the loss of teeth.[6]

The fact remains that, with all of the progress made by forensic dentistry, hundreds, perhaps even thousands, of civilian deaths alone remain unsolved each year. Humble remarks:

During the course of each year, in our larger cities, many unidentified bodies after street or river accidents are taken to the mortuaries. In London the most recent year for which figures are available is 1927. Other than newly born infants, 74 bodies found dead in that year remained unidentified two months after the end of the year. It is understood that this number is an average. In Paris in 1929 the number of unidentified bodies taken to the mortuaries was 276.[7]

At the conclusion of his study, Humble suggests certain actions which would increase the valuable use of teeth as means of identification: (1) When a body remains unidentified, a dental surgeon should be called in for examination of the teeth and jaws. If dental work has been done, a complete description of this work should be published in professional journals. (2) Dentists should keep careful records of work done. (3) Each denture should be stamped with a dentist's personal stamp received from the police authorities.

These suggestions are certainly of great value, and undoubtedly they should be put into practice even though they would not provide a *system* of identification, a means whereby, as with fingerprints, thousands of records could be readily screened for the appropriate one.

The history of forensic dentistry demonstrates that identification by teeth is positive. Sprawson says:

Speaking broadly, the teeth and parts adjacent to them, or even either by themselves, are as individual to their possessor as his fingerprints, but the former may, of course, be transient and not persist throughout life, but if the teeth are present in any numbers they may tell one many things about the life-history of the individual which one cannot learn from fingerprints.[8]

According to Humble:

There must be, therefore, in the future, a steadily increasing number of people who could be identified by means of teeth when all other methods fail. And identification by means of teeth is absolutely conclusive. To prove this to the layman it is only necessary to state that the full complement of teeth is 32; that each tooth has five surfaces marked in characteristic but varied ways by fissures and grooves, that the arch of the palate, the curvature of the teeth, the mode of occlusion and the structure of the jaws show very wide variations. Even with the full complement of teeth, duplication of two dentitions has never been shown. When, therefore, there may be fillings, inlays, crowns, partial dentures or absence of one or more teeth it will be recognized that it is impossible for any two human dentitions to be exactly similar.[9]

Thus the present state of forensic dentistry may be summarized as follows: There is a great need for a means of identification supplemental to fingerprinting, since in both military and civilian life there are hundreds and thousands of cases of unidentified bodies and persons annually. Many cases of identification by teeth have been recorded. Identification by teeth is positive, since teeth are as individual to persons as are fingerprints. However, the cases of identification by teeth are isolated and dependent in large part upon coincidence. The true possibilities of identification by teeth as a supplement to fingerprinting can be realized only by development of a method of screening thousands of records to isolate the one needed for identification in each case.

6. Brekhus, P. J.: Report on a Statistical Investigation on Loss of Human Teeth. J.A.D.A. 15:679, April 1928.
7. Humble, op. cit., p. 82.
8. Sprawson, op. cit., p. 4.
9. Humble, op. cit., p. 82.

Certain assumptions are necessary before development can be made of any systematic method of identification by teeth. Two necessary assumptions are these:

1. The teeth are relatively indestructible. Were teeth as destructible as fingerprints, for example, they would not provide a particularly valuable supplement to present systematic methods of identification. "It seems an ironical circumstance that the teeth which so easily fall prey to decay in the living outlast every other part of the body in the dead, and may even remain preserved for centuries as is evidenced by the findings of ancient human relics."[10] One reason for this relative indestructibility is that the enamel of the teeth is between 97 and 98 per cent inorganic in composition, as noted by Schirnding.[11] Another reason is that the teeth are in a relatively protected part of the body. In his essay Schirnding cites many examples of fires and mutilation of bodies in which the preservation of teeth provided the sole means of identification of the corpses.

2. No two dentitions are alike. Humble's remarks about variety of dentitions have already been quoted. Additional factors have been noted by Dutra[12]:

> It is extremely unlikely that the absence of certain teeth and repairs of others would be reproduced in an identical manner in any two persons. The probability of exact reproduction of dental work is further diminished by the differences in materials utilized for fillings; in one person these may be gold, in another amalgam. A specimen can easily be compared with dental records because of the diagrammatic simplicity of the latter.

10. Editorial: Posthumous Identification. Am. J. Orthodont. & Oral Surg. 28:546, 1942.

11. Schirnding, Henry: The Teeth and Their Significance in Forensic Medicine, with Special Regard to the Identification of Corpses. D. Cosmos 76:859, August 1934.

12. Dutra, Frank: Identification of Persons and Determination of Cause of Death from Skeletal Remains. Arch. Path. 38:339, November 1944.

Problems Involved

To provide a system of using dental characteristics for identification, the authors of this paper were faced with the problem of finding a means to convert records of dental characteristics to records which could be assembled readily and which could be sorted rapidly and positively to isolate any particular set of characteristics. To be successful as an actual *system* which could be used among millions of persons, a medium of recording must be found which is simple enough to be workable by many people in many different areas with a minimum expenditure of time. The medium of recording must be complex enough to record dental characteristics in great variety, so that sorting for particular characteristics among even millions of records would isolate at most only a very few cases for final identification by a dental surgeon. Finally, the medium of recording must be such that any one record could easily be revised or replaced, so that all records could be kept current.

System Suggested

We concluded that the cards utilized in the International Business Machines units would provide the best available means of recording. These units provide a key-punch machine, by which cards can be punched rapidly, and a collator, by which cards can be sorted mechanically in mass for any particular set of punches.

The first problem was to devise a system of converting dental data to numerical values adaptable to the I.B.M. card. This involved (1) a selection of dental characteristics to be recorded and given numerical value and (2) a division of the numerical positions on the card into advisable categories.

Schirnding has suggested that the dental factors to be considered in identification should be: presence of decayed teeth, stumps, irregularities in dentition,

evidence of extractions, fillings, artificial dentures. For machine coding we have found it necessary in our tests to use only fillings, missing teeth, crowns and bridge abutments. In addition, fillings, crowns and bridge abutments are further distinguished by materials.

Tests were made from military records, so that designation of card for person was made through serial number of the soldier. Similar designation of person by number could be used by the system in civilian life; numbering of persons is used at present, for example, in the social security service. Eight columns of numbers were used for the serial number of the soldier. The next two columns indicated age. The following four columns, two for the upper jaw and two for the lower jaw, were reserved for "type" of dental work, to differentiate among bridges, partial dentures and full dentures. In tests of the system to date, we have found it unnecessary to punch these columns at all. The following sixty-four columns are divided into upper and lower, right and left, with two columns for each of the thirty-two teeth.

Thus was provided for each tooth a coding possibility of 00 to 99. For the dentition the purely mathematical variation possible in such a combination is expressed in the figure 32 to the 101st power, a truly astronomical number approaching in possibilities, for all practical purposes, the astounding and almost infinite variety of dentitions. To this variety of possibilities could easily be added the coding under the columns headed "type." In actual practice so far, however, we have found it unnecessary to use more than a small portion of this mathematical possibility to code the needed selection of dental characteristics.

Testing of System in Sample Situation

Fortunately, we were able to use complete dental records of 4,000 Army personnel for a test of the coding system. Each of these records was coded, and for each an I.B.M. card 5080 was punched. In many sample tests viewed by various military personnel, any one of the sets of dental characteristics was isolated by the collator within an hour.

Mechanical features of the tests were most important, and these should be noted. Machines used were standard products of International Business Machines in common use in many offices. With the key-punch, an operator is able to punch 350 to 400 cards an hour. The collator used was able to screen only the upper or lower jaw at one time; it operated at the rate of 240 cards a minute. With a sorter, capable of screening all factors at one time, cards could be screened at the rate of 500 a minute. A new card, to show dental characteristics after new work has been done by the dentist, can readily be punched and can be substituted for the old card mechanically by the collator.

Critical Considerations

Certain critical considerations are to be noted about the system described above:

1. Our tests with 4,000 cases demonstrate that any particular set of dental characteristics can be isolated rapidly and positively.

2. Labor involved in the system is not unduly great, and the machines used are standard equipment in many offices throughout the country. The necessary cards are punched and sorted in a short time, and revised forms are readily made and exchanged mechanically for the old forms.

3. The weakness of the system appears most critical in that it would not be able to differentiate among perfect dentitions and among full dentures in both jaws. Perfect dentitions are, of course, not very numerous among adolescents and adults. With widespread systematic use of teeth

for identification, these relatively few cases need not be excluded from the system, since impressions or models of the dentitions could be made. The problem of full dentures is even more easily solved by Humble's suggestion that all full dentures be stamped. The stamp might be, as Humble suggested, a dentist's code number provided by the police authorities, or it might more easily be the patient's name. Stamping of the patient's name in full dentures is already customary in military practice and ought to be extended to civilian practice.

4. Experience with the system to date indicates that the data to be recorded on the machine records need include only fillings, missing teeth, crowns and bridge abutments. Experience with the system among hundreds of thousands of cases may indicate that a greater variety of dental characteristics needs to be recorded in order to differentiate positively among so many records. It will be noted that this might easily be done in the system suggested, since characteristics to date are recorded on less than half of I.B.M. card 5080. The first addition might well be to code the columns headed "type," to differentiate among bridges, partial dentures and full dentures. If even greater diversity of characteristics noted and recorded were found necessary, expansion of the code could readily include the five surfaces of the tooth.

5. It is to be emphasized that the system proposed is not a system of identification of persons, but a system of sorting records. In all cases, identification must actually and finally be made by the dental surgeon, but, without means of sorting through hundreds of thousands of records, identification by teeth can never be so systematic and so valuable as its possibilities and its need indicate it should be. The system proposed is offered as a method of systematic recording of dental characteristics and of mechanical handling of these records. In sorting, it would isolate at most a very few records of somewhat similar characteristics, with the dental surgeon making final identification by detailed examination.

Application of System

In suggesting such a new system of handling dental records, we are able merely to suggest some of its possible applications. With increasing use of the system, new possibilities would occur which are impossible to visualize now.

Perhaps the most immediate application of the system could be in the military service. In time of war, at least, problems of identification are most acute in military life, and the necessary conditions of the system—universal dental care and dental records—are available in the military service. Use of machine records is also standard in much work of the military forces. For the dental officer, the system would introduce no new work. He need have only a table of coding, and his records would be simpler than those used in his work at present.

In civilian life first uses of the system might well be by the insurance companies. Such positive identification as is provided by dental characteristics would save insurance companies thousands of dollars in costly litigation concerning identity of insured persons. With a dental examination and record added to the medical examination at present required by most insurance companies, with coding by policy numbers and with their customary use of machine records, insurers could readily adopt the identification system suggested in this paper.

Such positive means of identification would be of great value also to those industries in which employment or service is occasionally hazardous and death sometimes violent, such as transportation, mining and manufacturing explosives. Insurers in such industries and

agencies providing public insurance and compensation for accidents would find the system of great value.

Ultimately, one may well visualize that, with the universal need for a positive system of identification, records required for the system would be kept throughout the nation and would be located in county seats or other centers of geographic divisions. National use of the system would guard us against the tragedy and pathos of failures to identify persons.

To members of the dental profession, universal use of this system of identification would require no re-training and no additions to the curricula of dental colleges. The only change from present practice which would be required is the keeping of fuller records than are now common throughout the profession. Members of the dental profession would need to make records not only of new work done upon a patient's call, but also of work done before, perhaps by another dentist. The additional labor would be negligible in view of its great value to the public served by the profession.

Finally, universal use of the teeth for identification would require that all persons have dental examinations. This would be a great step forward in the extension of dental service and dental education to the entire public, one of the most pertinent problems faced by the profession today.

Summary

1. Need is evident in both military and civilian life for a positive means of identification supplemental to fingerprinting and other methods used today.

2. Teeth have long been recognized as a positive means of identification and many isolated cases of identification by teeth have been recorded, but as yet no systematic method of using these possibilities has been proposed.

3. Assumptions behind any system of identification by teeth are that the teeth are relatively indestructible and that no two dentitions are exactly alike.

4. Problems involved in a system of identification by teeth are to convert dental data to records which can be readily handled and sorted on a mass basis, and to provide a method of recording which is simple enough for mass use and at the same time complex enough to record dental characteristics in necessary variety.

5. The method suggested in this study is to convert data of dental characteristics to numbers on machine record cards capable of being punched and sorted by machines, such machines providing the speed, diversity, accuracy and ease of handling required of a system of identification. A selection of dental characteristics and a method of recording were suggested.

6. Tests of this system with 4,000 cases demonstrated the speed and accuracy with which the records can be made and can be sorted to isolate any particular set of characteristics for identification.

7. Critical consideration of the system shows that it would be of lesser value in cases of perfect dentitions or of full dentures in both jaws, but these cases can be included in a system of identification by the use of casts of the teeth in the case of perfect dentitions and by the stamping of names into full dentures.

8. The system proposed is a method of sorting records of dental characteristics on a mass basis, not of identification; final identification would require the services of a dental surgeon.

9. Application of the system would seem most immediately possible in the military forces and among insurance companies, but its value may well lead to its universal use throughout the nation.—*155 Hyde Street.*

A COMPARISON OF METHODS OF TREATING VINCENT'S INFECTION

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Vincent's infection as a disease entity has received the attention of research workers and clinicians, principally since its outbreak among the American troops during World War I. The literature has become a maze of statements and counterstatements as to causative agents and as to methods of treatment.

The bacteria *Fusiformis dentium* and *Borrelia vincenti*, acting in symbiosis, are, at the present time, regarded by many as the causative agents. Before such a role can be assigned to these organisms, further investigations of the entire flora of the oral cavity must be undertaken.

Many mouths that are entirely free from the clinical manifestations of Vincent's infection will yield a positive bacteriologic smear. Many similar mouths will be entirely free from the organisms often regarded as causative. The utilization of bacteriologic smears in diagnosis is of little value in the absence of clinical symptoms of the disease.

There is agreement in the literature to the effect that there are a number of predisposing factors in the disease, including dietary deficiency, blood dyscrasia, debilitating disease and chronic irritation of a chemical or physical nature. The extent to which any of the predisposing factors influence the course of the disease has not been defined. Many authors have stated that a deficiency in vitamin B_2, vitamin D, nicotinic acid or ascorbic acid is conducive to Vincent's infection. Employment of any or all of the vitamin compounds in treatment is of questionable value since it is doubtful whether dentists, without complicated laboratory procedures, are able to determine which, if any, of the vitamins are lacking in the diet.

The occurrence of many cases of Vincent's infection with such a maze of predisposing factors creates a lack of certainty among clinicians as to the causative factors in the disease. Likewise, the response of Vincent's infection to treatment by a multiplicity of medicaments, dietary measures, radiation and cautery leads one to believe that almost anything would do.

In many cases, certain medicaments have been used because of the organisms involved. For example, oxidizing agents have been used to combat the anaerobes, while other agents have been directed against the spirochetes.

The type of agent most commonly used at present is the oxidizing agent. Through their oxygen-liberating action, they exert a mechanical cleansing action in addition to inhibiting the growth of anaerobic bacteria.

More popular among physicians is the use of arsenicals of various types, such as arsphenamine, neo-arsphenamine or mapharsen. These are applied locally or are administered intravenously, the latter being the preferred method. Bismuth compounds have likewise been used. Because of their success in the destruction of the spirochete of syphilis *(Treponema pallidum)*, these agents have been advocated in the treatment of Vincent's infection *(Treponema [Borrelia] vincenti)*.

A great number of drugs which are not classified as either oxidizing agents or arsenicals have been suggested for the treatment of this disease. These are of various types and of varying degrees of efficacy, including metaphen, mercuro-

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chrome, methylene blue, gentian violet, viogen (Berwick's dye), soaps of various types, zinc iodide paste, zinc chloride, phenol in glycerin and trichloracetic acid. In addition to the above-mentioned chemical medicaments, cautery has been employed, as have dietary measures and infra-red and ultraviolet radiation. More recently, penicillin has been suggested as a possible therapeutic agent.

There is scarcely an agent advocated for the treatment of Vincent's infection regarding which it is not possible to find a diametrically opposed view. This confusion has resulted from the apparent lack of facts recorded or substantiated under controlled conditions. The views presented merely express the opinions of the clinicians. Thus, the dentist as well as the physician employs the method of treatment presented to him in the most exemplary manner or he uses the methods and the medication covered in his professional training.

According to the report of the Council on Dental Therapeutics of the American Dental Association for 1942,[1] several clinicians have expressed the opinion that drugs may be no more important or may be actually less important than other means designed to improve oral cleanliness and general health. This statement led the members of the oral hygiene section of the dental service at this hospital to attempt to ascertain which of the commonly employed methods is best for the treatment of Vincent's infection.

In the past year, there has been a considerable increase in the number of cases of Vincent's infection referred to this dental clinic for treatment. Five hundred and eight individual cases were treated by the oral hygiene section during the period from September 2, 1943, to September 6, 1944.

In order to comply with the requirements for a diagnosis of Vincent's infection as accepted by the dental profession, the following clinical symptoms must be present almost *in toto:* (1) inflammation of the mucosa with engorgement of the interdental papillae; (2) ulceration of the papillae, which are ragged and raw, bleed freely and are covered with an easily removed gray pseudomembrane; (3) inversion of papillae, with a crater-like appearance; (4) characteristic fetid odor, and (5) considerable pain in the gingivae, with accompanying recession.[2]

In the more advanced cases, systemic involvement was noted, including an increase in temperature, enlargement of the regional lymph glands and a general malaise. Regardless of which of the foregoing symptoms were absent, one condition was always noted in the cases of Vincent's infection examined; that is, poor oral hygiene. Invariably, the severe case was thus marked. Some cases were aggravated by malposition of the teeth and faulty dental restorations. In some cases, the tonsillar fossae were involved. In several cases, ulcers one-half inch across or larger were present on the tonsils. Cheek ulcers of similar measurements were noted in two cases.

To substantiate a diagnosis of Vincent's infection, a smear was made from the gingival crevices. If the report indicated that *Borrelia vincenti* and *Fusiformis dentium* were present in appreciable numbers, the diagnosis was considered positive. Treatment by one of several methods was undertaken, being continued until all clinical symptoms were eliminated and a negative report was returned from the laboratory.

The disappearance of clinical symptoms was noted to occur before a negative report could come from the laboratory. Failure to recognize this fact may account for the premature dismissal of patients followed by their return with a

1. Council on Dental Therapeutics: Treatment of Vincent's Infection. J.A.D.A. 29:461, March 1942.

2. Lyons, D. C.: Monograph on Bacteriology and Control of Vincent's Infection and Associated Diseases. D. Items Int. 65:211, March 1943.

recrudescence of the infection. In such cases, relief from the immediate acute symptoms only had been obtained.

Patients were selected for this study in the order of their appearance at the dental clinic. The first fifty or sixty patients were treated by one method regardless of the extent or severity of the case. The next fifty or sixty were treated by another method, and so on. This procedure was repeated throughout the entire study in order to eliminate errors, which would have arisen from selecting individual cases for a particular method of treatment.

The cases were arbitrarily classified according to clinical symptoms as slight, medium or severe. The slight cases were those in which only a few interdental papillae were involved. The severe cases were those presenting involvement of all interdental papillae as well as the surrounding gingival tissue. This group included those cases with extension of the ulcers to the palate or the cheeks. Cases falling between these extremes were classified as medium. This group represented the average case of Vincent's infection as seen by the clinician and comprised the greatest number of cases. To reduce errors in judgment in the assignment of cases to one of these categories, it was decided that I should determine to which grouping each should be assigned. By this method, the personal error in judgment would tend to adjust itself over a great number of cases.

The treatment methods employed included the use of at least one of the medicaments from each of the groupings of agents mentioned earlier. In addition, a control method of treatment was evolved.

In the treatment methods requiring a medicament, the mouth was irrigated with two or three pressure-spray bottles full of hydrogen peroxide diluted one-half with warm water. Care was taken to remove débris from the necks of the teeth as well as to clean out the gingival pockets. The spray was so regulated as not to exert too great a pressure on the irritated and tender gingivae. At the first sitting, the large easily detached portions of calculus were removed from the necks of the teeth.

The mouth was divided into sections, each of which was treated separately. The cuspids formed the line of separation of the right, central and left section of both arches. Each section was isolated by means of cotton rolls. Saliva was removed from around the necks of these teeth by means of a warm-air pressure syringe. The selected medicament was then applied to the dried gingivae by encircling the necks of each tooth individually. The beaks of cotton pliers were used as a carrier and applicator. Care was exercised to place sufficient medicament in each interproximal space to allow the fluid to reach the bottom of the gingival pockets.

On completion of treatment of a section, the same procedure was undertaken in the adjacent section, until the entire mouth was completely treated. On each successive daily visit, the whole procedure was repeated. As much further scaling was done at each visit as was possible without unnecessary injury to the underlying gingivae.

The medicaments employed included viogen (Berwick's dye), 10 per cent mercurochrome, 10 per cent neo-arsphenamine in glycerin and Churchill's iodine followed by 10 per cent silver nitrate.

When 7 per cent chromic acid was used, it was immediately neutralized with a hydrogen peroxide pressure spray after application about the necks of the teeth of each section and before proceeding to the next section.

In the chromic acid and scaling technic, the scalers were dipped in the chromic acid each time a scaling operation was attempted. This technic was utilized in order to carry the chromic acid deeper into the gingival crevices than might be possible with cotton pliers.

Table 1.—Results with Various Types of Treatment

Type of Treatment	Number of Cases	Number Cured	Number Patients Failing to Return
Berwick's dye	58	46	12
Churchill's iodine and 10 per cent silver nitrate	65	48	17
7 per cent chromic acid	50	37	13
7 per cent chromic acid and scaling	28	27	1
Scaling and hydrogen peroxide	72	58	14
Scaling and water	96	77	19
10 per cent neo-arsphenamine	86	71	15
10 per cent mercurochrome	53	46	7
Total	508	410	98

Neutralization of the chromic acid with hydrogen peroxide followed the scaling of each section.

In another series of cases, it was decided to eliminate any medicament from the scalers during the curettage. The hydrogen peroxide spray was continued as before for each visit. In addition, hydrogen peroxide diluted 50 per cent was used as a vehicle for carrying off the loose débris after scaling.

A control method of treatment employed mouth irrigation with two or three pressure spray bottles of warm water for the removal of the loose calcareous débris. Careful scaling was undertaken with a fine modified Younger scaler to remove the subgingival calculus. Such scaling was begun at the first sitting and carried deeper into the gingival crevices at each successive daily visit. With this method, no medicaments of any type were employed.

For home care in all treatment technics except one, a mouth wash of hydrogen peroxide diluted 50 per cent was used three times a day. In the technic employing water and scaling only, the patient similarly used only a warm water mouth wash at home.

The results obtained from this study are recorded in the accompanying tables.

In Table 1, the various medicaments and treatment methods employed are listed separately in the first column. In the next column are listed the number of cases treated by each technic, while the third column indicates the number of cases carried to completion or cure. The difference in the numerical values of these two columns is not to be construed as indicative of the efficacy of each technic. The lesser number of cases cured than of cases treated is accounted for by the failure of patients, both civilian and military, to continue treatment until a negative bacterial smear was obtained. As it is not always possible to retain soldiers in the hospital for treatment of Vincent's infection alone, many were transferred or discharged before completion of treatment. Other outpatients over whom there was little or no jurisdiction failed to return when clinical symptoms subsided. Of the 508 cases diagnosed as Vincent's infection, 410 were completed and the patient discharged as cured.

During the study, it was found that the number of patients returning for resumption of treatment after being discharged as cured was small. In fact, only ten returned. It is impossible to say whether these were cases of recurrence or reinfection.

In Table 2, the same medicaments and methods listed in Table 1 are shown and the number of patients discharged as cured are classified according to the category in which they were placed at the time of admission. The number of cases of each type is listed in the proper column. In the next three columns the number of days required to obtain a cure,

Table 2.—Results in Cases of Varying Severity Under Various Treatments

Type of Treatment	Number of Cases			Average Number of Days for Cure		
	Slight	Medium	Severe	Slight	Medium	Severe
Berwick's dye	15	22	9	4	16	24
Churchill's iodine and 10 per cent silver nitrate	19	21	8	9	14	32
7 per cent chromic acid	9	19	9	7	16	29
7 per cent chromic acid and scaling	4	12	11	8	16	29
Scaling and hydrogen peroxide	11	31	16	7	14	28
Scaling and water	26	40	11	6	16	36
10 per cent neo-arsphenamine	17	45	9	6	15	33
10 per cent mercurochrome	16	23	7	5	13	28

substantiated by a negative bacteriologic smear, is indicated. These values, in days, represent a daily visit of the patient, starting with the initial visit and continuing until a cure could be substantiated.

Conclusion

In all cases treated, clinical symptoms disappeared several days before a negative bacteriologic smear could be obtained. Thus the time required to confirm a cure is longer than is ordinarily believed.

The time required for the cure of Vincent's infection appears to be dependent on the severity of the case and not on the medicament or method used. The variation in number of days required for a cure for each technic is so small that it is of little importance.

From this study, it was found that, with the maintenance of adequate oral hygiene solely by mechanical cleansing and entirely without the use of medicaments, as such, cures for Vincent's infection can be obtained in the length of time required with the use of drugs. Thus it appears that oral hygiene is the principal factor in curing Vincent's infection. —*Fitzsimons General Hospital.*

COMPARATIVE METHODS OF USING PENICILLIN IN THE TREATMENT OF VINCENT'S INFECTION AND OTHER ORAL LESIONS

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The usefulness of penicillin in treating some oral infections is well established, but the most effective method of using this valuable antibiotic substance has yet to be determined. The following report is based on the experience gained in attempting to determine the most effective technic in administering penicillin topically and orally in the treatment of oral lesions. Only the more severe cases and those which failed to respond to other forms of therapy were used in this series.

Penicillin Paste

Thexton and Dick[1] have described the

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1. Thexton, R., and Dick, P. K.: Penicillin Packs in Treatment of Vincent's Infection, Brit. D. J. 78:292, May 18, 1945.

use of a penicillin pack in treating Vincent's infection. They used as stock 2 gm. of magnesium oxide to 100,000 units of penicillin. To this was added pure olive oil to make a paste and also cotton to help keep the paste in the area of application. This paste was sufficient for forty treatments.

I have altered the formula, using 200,000 units of penicillin to 2 gm. of magnesium oxide. I found the addition of cotton unnecessary and add only olive oil to bring the paste to the consistency of thick cream. This paste is packed around the teeth and forced into the interproximal spaces, which have first been isolated and dried, where it is retained for several hours.

I have used this paste successfully in twenty-two cases: nine cases of acute Vincent's infection, six cases of chronic Vincent's infection, four cases of periodontoclasia and three cases of dry socket or alveolalgia. The following typical case histories are interesting:

A. Chronic Vincent's Infection

Case 1.—A 17-year-old Negro entered the clinic as an emergency case, complaining of a "sore mouth."

Examination.—The patient had a chronic case of Vincent's infection in addition to Schmutz pyorrhea. His gingivae were tender and would bleed upon pressure, or at times spontaneously. There was much inflammation in the upper right quadrant of the mouth. The maxillary right first molar was badly decayed and had deep periodontal pockets on either side. There was a heavy calculus deposit throughout the mouth.

Treatment and Course.—On August 22, the mouth was sprayed with hydrogen peroxide, the teeth were carefully scaled and dried and a thick paste of penicillin was placed around the teeth and gingivae.

On August 29, all of the symptoms had disappeared and the gingivae appeared normal. At this time the periodontal pockets were again curetted, the teeth were given a thorough prophylaxis and the paste was applied as before.

On August 30, the gingivae were normal. Instructions were given in proper brushing of the teeth and massage of the gums, and the patient was discharged. Subsequent check-ups showed the gingivae to be firm and normal in appearance.

Case 2.—A man, aged 29, reported to the clinic on August 23, complaining of "sore gums." He had had a history of Vincent's infection two years prior to the time of examination.

Examination.—All of the interdental papillae were necrotic, and much tissue had been lost. The gingivae would bleed easily, and the mouth had the characteristic odor of Vincent's infection. Microscopic examination showed large numbers of Vincent's organisms.

Treatment and Course.—Since the gingivae were so tender, the teeth were only lightly scaled and a thick paste of penicillin was placed around them. On August 24, all of the odor was gone, the color was better and practically no bleeding was apparent. The teeth were thoroughly scaled and polished, and penicillin paste was again applied.

On August 27, the gingivae and the oral flora were normal. The gingival pockets were treated, and instruction in proper brushing and gum massage was given. The treatment was repeated on August 29, and the patient was discharged as cured two days later. Subsequent check-ups have shown the gingivae to be in a healthy condition.

B. Acute Vincent's Infection

Case 3.—A man, aged 24, reported to the clinic on August 27, complaining of "sore gums." He had been using hot saline rinses for two weeks but had been afforded no relief.

Examination.—The interdental papillae, in the lower anterior part of the mouth, were necrotic and would bleed easily. The lower left posterior area of the mouth was also involved. The odor was typical of Vincent's infection, and smears showed an abundance of Vincent's organisms.

Treatment and Course.—The areas were too tender to scale; therefore hydrogen peroxide spray was used to dislodge any loose tissue. The mouth was then washed with warm water and dried with blasts of warm air. A thick mixture of penicillin paste

was placed around the teeth and the involved areas.

On August 28, there was a marked improvement, practically all of the odor, tenderness and acute inflammation having subsided. The teeth were lightly scaled and the paste was again applied.

On August 29, the gingivae were completely normal. The teeth were completely scaled and polished and the paste was applied as before.

On August 30, the oral flora were normal. Proper brushing and massage of the teeth and gingivae were explained and demonstrated, and the patient was discharged.

Case 4.—A man, aged 26, reported to the clinic complaining of pain and odor in the upper portion of his palate.

Examination.—Necrotic tissue was found behind the maxillary right and left central incisors. The area was extremely tender, and the odor was characteristic of Vincent's infection. The remainder of the mouth was healthy and apparently well cared for. Both maxillary left bicuspids and the maxillary right first molar were missing and had been replaced by a partial denture which the patient was not wearing at the time of examination.

Treatment and Course.—Penicillin paste was applied to the area. Two days later the necrosis was gone and a new membrane covered the area. Upon further questioning, it was learned that the denture was causing pressure on the involved area and that the patient had been unable to wear the denture for the past three days. The rough spots on the denture were removed so that the patient can now wear it comfortably. The lesion has not returned and the gingivae are in a healthy condition.

C. Alveolalgia

Detailed records were not kept for the cases of alveolalgia, since I was called into surgery to observe them. In each case that I observed, the patient, several days after having had a tooth extracted in the mandibular molar region, complained of pain in that area. A normal clot was not present, and exposed bone was evident. In each case there was immediate relief and normal uneventful healing after one application of the penicillin paste.

Penicillin Mouthwash

Kirby[2] found that the sodium salt of penicillin, when dissolved in normal saline or glucose solution, retains its potency at room temperature for at least forty-eight hours and, when placed in sealed bottles, retains potency for several weeks at 5° C. Cofield, Ferguson and Toye[3] obtained favorable results in treating Vincent's infection with topical applications of a penicillin solution. They used sterile gauze to isolate the areas to be treated, packed cotton in the interproximal spaces and then sprayed the area with 5 cc. of a solution containing 500 units of penicillin per cubic centimeter. McIntyre[4] and Schuessler and Fairchild[5] also obtained favorable results with topical applications.

In the light of these findings, I decided to try a mouthwash containing penicillin. The following formula was used: 200,000 units of penicillin sodium, 240 cc. of normal saline solution and peppermint water in quantity sufficient to impart the desired flavor. One prescription lasts for approximately twenty treatments.

This mouthwash was to be used every hour. The solution was to be kept in the mouth for at least five minutes and then swallowed. The patient was instructed not to rinse the mouth after using it. After the infection had been cleared by this method, thorough prophylaxis was given and hot saline rinses were prescribed to facilitate tissue healing.

2. Kirby, W. M. M.: Stability of Penicillin Solutions at Room and Incubator Temperatures. J.A.M.A. 125:628, July 1, 1944.

3. Cofield, K. R.; Ferguson, E. W., and Toye, Alfred E.: Topical Application of Penicillin in the Treatment of Vincent's Infection. J.A.D.A. 32:529, May 1, 1945.

4. McIntyre, A. D.: Cases of Acute Oral Lesions Treated with Penicillin. Brit. D. J. 78:262, May 4, 1945.

5. Schuessler, C. F., and Fairchild, J. M.: Penicillin in the Treatment of Vincent's Stomatitis. Bull. U. S. Army M. Dept. 3:15, February 1945.

Twenty-three cases were thus treated. They were divided as follows: twelve cases of chronic Vincent's infection, one of which was also a case of periodontoclasia, and eleven cases of acute Vincent's infection, three of which were true cases of Vincent's angina. Some interesting illustrative cases follow:

A. Acute Vincent's Infection

Case 5.—A man, aged 26, reported to the clinic on September 29, complaining of a sore throat and sore gingivae.

Examination.—A large ulcer arising behind the tuberosity on the left side, extending out to the cheek and back to the tonsillar area, was discovered. The entire area was necrotic and the odor was typical of Vincent's infection. The throat was infected, and trismus and adenopathy were present. Smears taken showed an abundance of Vincent's organisms. The maxillary left third molar was malposed.

Treatment and Course.—A prescription for the penicillin mouthwash was given to the patient. On October 1, the odor, trismus and adenopathy had subsided and the ulcer was practically healed. The patient was instructed to use hot saline rinses, and on October 3 the mouth was normal. At this time, the malposed molar, which had caused constant irritation in the area, was removed.

Case 6.—This case was referred to me after the condition had failed to respond to six treatments using Metaphen and gentian violet.

Examination.—The patient was first seen by me on October 4. He was unable to eat because of the acute tenderness of the gingivae. The oral odor was very unpleasant.

Treatment and Course.—The penicillin mouthwash was prescribed. On October 5, all of the pain and odor were gone and the ulcerations had healed. A thorough prophylaxis was given, and the patient was taught how to brush his teeth and massage his gums. He was directed to use a hot saline mouth rinse at home. On October 9 his mouth was normal.

Case 7.—This patient, aged 20, was referred on October 8 from the hospital where he was being treated for a fractured mandible. His jaws were wired together and he was therefore unable to pursue oral hygiene. Saline mouthwashes had been used to treat his acute Vincent's infection but had had no effect.

Treatment and Course.—The penicillin mouthwash was prescribed. On October 10, all of the pain and odor were gone and the gingivae appeared to be normal. A prophylaxis was impossible at this time but hot saline rinses were prescribed to be used until the wires were removed. On October 22, after the wires had been removed, the gingivae were normal. The patient received a thorough prophylaxis and was discharged.

B. Chronic Vincent's Infection

Case 8.—This case was referred to me after having had seven treatments between September 19 and October 5.

Examination.—When I first saw the patient on October 10, there was much destruction of the interdental papillae and the gingivae were quite tender. The typical odor of Vincent's infection was present, and smears confirmed the diagnosis of Vincent's infection.

Treatment and Course.—The penicillin mouthwash was prescribed. When the patient returned on October 11, he was asymptomatic. A thorough prophylaxis and a demonstration on the use of the toothbrush were given. Hot saline mouth rinses were prescribed. On October 15, the gingivae were normal and the patient was discharged.

Case 9.—This patient, aged 18, had received treatment at home, prior to his induction.

Examination.—When he reported on October 4, his mouth presented a typical picture of Schmutz pyorrhea. Smears taken showed heavy clusters of Vincent's organisms.

Treatment and Course.—The teeth were given a thorough prophylaxis. On October 5, the patient reported that his mouth felt much better. The penicillin mouthwash was prescribed. On October 8, the patient was asymptomatic. The periodontal pockets were treated then and again on October 13. He was instructed in the proper use of the toothbrush and told to use a saline rinse. On October 17, the gingivae were normal and the patient was discharged.

Oral Administration of Penicillin

I believe that it is the prevalent opinion that the oral administration of a

drug, whenever possible, is the simplest, most desirable procedure. The chief difficulty in administering certain drugs by mouth is their possible destruction by the free hydrochloric acid in the stomach. This action was demonstrated, in the case of penicillin, by the Oxford investigators.[6]

Rammelkamp and Helm[7] made studies on the absorption of penicillin in patients suffering from pernicious anemia. Since these patients also have achlorhydria, the penicillin will not be destroyed in the stomach. Blood levels were found to be therapeutically high. Thus, it would seem that, if it were possible to administer penicillin orally by some method designed to counteract gastric acidity, this method of administering the drug might prove to be valuable.

More recent studies by Bunn *et al.*[8] in treating pneumococcic pneumonia revealed that in no instance was it possible to demonstrate that any method was superior to the oral administration of powdered penicillin, in a capsule or dissolved in water. Finland, Meads and Ory[9] have used penicillin in saline solution, administered by mouth, with success. Keefer *et al.*[10] recommend an oral dose three to five times the parenteral dose.

I decided to try the following formula: 50,000 units of penicillin sodium and 0.3 gm. of magnesium oxide, in a gelatin capsule. I had been using the magnesium oxide penicillin base for the paste preparation and decided that it would be safe to try this powder base in capsule form. A dose of 5 to 20 grains of magnesium oxide acts as an antacid and is far more gentle in action than sodium bicarbonate.

This form of administration was used in twelve cases: seven patients with chronic Vincent's infection, one of which also had aphthae on the tongue and gingivae, and five with acute Vincent's infection. Several typical cases are described below:

A. Acute Vincent's Infection

Case 10.—This patient, aged 18, had had his mandibular left first molar extracted on October 3.

Examination.—The surrounding tissues were necrotic and a large ulcer had developed. A diagnosis was made of Vincent's infection. When the patient was referred to me on October 12, his mouth was too tender to handle.

Treatment and Course.—Seven capsules of penicillin, each containing 50,000 units, were given, one capsule to be taken every two hours. On October 13, all of the pain and odor were gone and the ulcer had almost completely healed. A thorough prophylaxis was given, and the patient received eight more capsules, one to be taken every two hours. On October 15, the gingivae were normal and the patient was discharged.

B. Chronic Vincent's Infection

Case 11. This patient, aged 18, reported on October 20.

Examination.—The patient had painful aphthae on the inner mucous membrane of the lip and tongue. There were two small ulcers on the mucobuccal fold below the mandibular first and second right bicuspids. Smears taken at this time were found to be highly active with Vincent's organisms. The interdental papillae were necrotic and inflamed.

Treatment and Course.—At this time only the calculus surrounding the teeth was removed. On October 22, the teeth were polished and the patient received ten capsules, each containing 50,000 units of penicillin. One capsule was to be taken every two hours. On October 23, the patient was

6. Abraham, E. P., et al.: Further Observations on Penicillin. Lancet 2:177, August 16, 1941.

7. Rammelkamp, C. H., and Helm, J. D., Jr.: Studies on the Absorption of Penicillin from the Stomach. Proc. Soc. Exper. Biol. & Med. 54:324, December 1943.

8. Bunn, P. A., et al.: Treatment of Pneumococcic Pneumonia with Orally Administered Penicillin. J.A.M.A. 129:320, September 29, 1945.

9. Finland, Maxwell; Meads, Manson, and Ory, E. M.: Oral Penicillin. J.A.M.A. 129: 315, September 29, 1945.

10. Keefer, C. S., et al.: New Dosage Forms of Penicillin. J.A.M.A. 128:1161, August 18, 1945.

asymptomatic. He was instructed in the proper use of the toothbrush and advised to use a saline mouthwash. On October 25, the gingivae were still normal and the patient was discharged.

Case 12.—This patient, aged 25, was referred to me on November 1 after having received previous treatment.

Examination.—The gingivae were tender, and purulent exudate was evident. The characteristic odor of Vincent's infection was present, and smears taken at the time were positive.

Treatment and Course.—The patient had previously received a thorough prophylaxis so that no treatment, except for twelve capsules each containing 50,000 units of penicillin, was given. He was instructed in the use of the toothbrush. On November 2, the gingivae were completely healed; they were firm and of a healthy color. Smears taken were negative. The patient was discharged.

Discussion and Summary

Nonspecific Treatment.—It is of the utmost importance that the dentist be aware that the administration of any drug or drugs in the treatment of Vincent's infection is not enough to prevent recurrence or to effect a complete cure. Such therapy must be supplemented by calculus removal, oral prophylaxis, elimination of faulty dentistry, restoration of decayed teeth, elimination of periodontal pockets and correction of diet deficiencies. The patient must be thoroughly instructed in proper methods of oral hygiene. These methods, by eliminating local irritating factors, will help raise the tissue resistance, and, when used in conjunction with penicillin, will help effect a permanent cure. It will be noted that, in all of the cases cited, use was made of one or all of the above-described methods in conjunction with the penicillin therapy.

Penicillin Paste.—The application of penicillin paste was used to treat twenty-two cases of oral lesions successfully. This paste is simple to use and to prepare. The stock powder can be kept at room temperature for as long as two weeks. When the paste is needed, a little of the powder is mixed with a drop or two of olive oil and spatulated to the desired consistency.

When the paste is applied to the raw tissues, it gives immediate relief. The pain associated with Vincent's infection is usually gone after one application, so that other corrective treatment can be given almost immediately. If a hydrogen peroxide mouthwash was used three to four hours after the application of the paste, it was found that simple, uncomplicated cases of Vincent's infection could be cleared up after one treatment, and severe infections after several days of treatment. This paste was also found to be useful in treating periodontoclasia and dry sockets.

Penicillin Mouthwash.—The penicillin mouthwash was used in successfully treating twenty-three cases. It was found that the results were somewhat better if the solution was used first as a rinse for five minutes and then swallowed. Finland, Meads and Ory[9] found that therapeutic blood levels could be established when saline solutions of penicillin were taken internally.

This mouthwash brought immediate relief from pain, and the treatment required was even simpler than that with the penicillin paste. In only one case of the twenty-three was it necessary to prescribe the mouthwash a second time. In all other instances, only one prescription (which, when used every hour, would last for approximately twenty treatments) was sufficient to clear even the most severe infection. After the infection had been cleared up, hot saline rinses were prescribed to facilitate tissue healing.

Oral Administration of Penicillin.—Mention has already been made of the fact that the oral administration of a drug, when feasible, is the simplest method for medication. The oral ad-

ministration of penicillin proved effective in this study when used in twelve cases.

The early Oxford investigators[6] have shown that, when penicillin is administered internally to cats, varying quantities of the drug can be found in the saliva. Thus the internal administration may be effective on two counts: it acts via the circulation, and it acts locally via the saliva. This may account for the excellent results obtained in this series.

Depending upon the severity of the infection, 10 to 15 capsules, each containing 50,000 units of penicillin, were all that was required to effect a cure.

Samples of the penicillin and magnesium oxide powder were periodically sent to the laboratory to be tested for potency. It was found that there was no loss of potency at room temperatures for as long a period as two weeks. Clinical findings were in complete agreement with the laboratory findings.

The calcium salt of penicillin would have been used in these observations had it been available, since it is nonhygroscopic and thus more stable.

The only disadvantages in the oral administration is the need to use large quantities of penicillin, which, at the present time, is quite expensive. When, in the not too distant future, more penicillin is available and the cost is consequently lowered, this disadvantage will be removed.—*243 Denslow Avenue, Westwood.*

FIBRIN FOAM AND THROMBIN AS USED IN THE SURGICAL REMOVAL OF A LARGE FIBROMYXOMA OF THE MANDIBLE

Leonard Weiner, D.M.D., and Arthur H. Wald,* D.D.S.,*
Tucson, Ariz.

In an effort to evaluate the use and indications in oral surgery of several of the new human blood derivatives, a series of cases is now being studied. Of these, one is, we believe, of such clinical and academic value as to warrant an immediate case report. After further investigation, we will analyze the remainder of the work.

The isolation of these blood derivatives was accomplished at Harvard University under the direction of Edwin J. Cohn.† The derivatives are obtained by fractionating pooled human plasma into its component parts, which comprise approximately five basic groups.

Groups I and III, with which we are concerned at this time, contain the elements necessary for blood coagulation. Fibrinogen (Group I) is a large molecule of basic importance in the formation of the clot, for, upon internal rearrangement, it becomes fibrin in the presence of thrombin and tissue calcium. Thrombin (Group III-2) is derived from prothrombin, a large globulin molecule, when the latter is activated by thromboplastin and

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†The fibrin foam and thrombin employed in this work were developed from blood collected for the American Red Cross by the Department of Physical Chemistry, Harvard Medical School, under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and Harvard University.

Fig. 1.—Preoperative photograph, illustrating bulge in mucobuccal fold.

calcium following neutralization of the anti-prothrombin.

Fibrin foam is the name given to a laboratory formed clot, made by reacting fibrinogen with thrombin under controlled conditions. The resulting mass is a fibrin clot of sponge-like consistency, with many of the usual physiologic characteristics and reactions of a normally formed clot. The fibrin foam, which we can now see is merely a preformed physiologic clot, may be used to fill a surgical defect. It may be expected to react in a normal manner, being first organized, then absorbed completely as it is replaced by granulation tissue. With the surgical defect so filled, collapse of the tissue is prevented, thus making possible a restoration of normal contour.

The procedures used in these cases are as follows:

1. Under sterile conditions the desiccated thrombin (one vial) is dissolved in 10 cc. of saline solution containing 60,000 units of penicillin.

2. The mass of fibrin foam is saturated with the thrombin-penicillin solution and inserted into the wound, care being taken that the saliva and any débris do not contaminate the area.

3. The margins of the wound are closely coapted with sutures for healing by primary intention.

This procedure was also employed in the case reported below. Saturating the fibrin foam with thrombin at the time of use gives it hemostatic properties. Besides holding the thrombin at the required site for hemostasis, the foam,

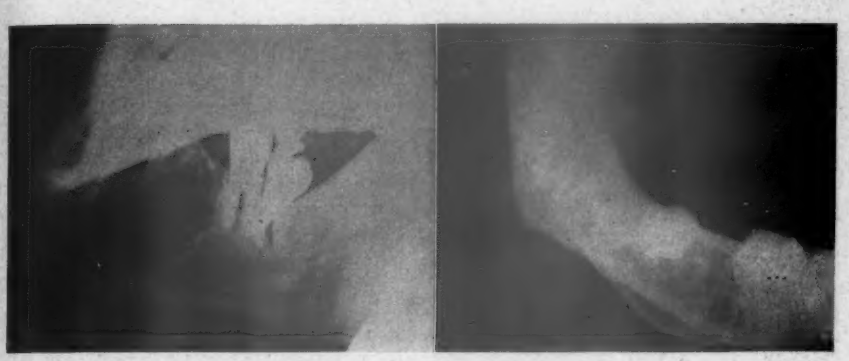

Fig. 2.—Preoperative roentgenograms.

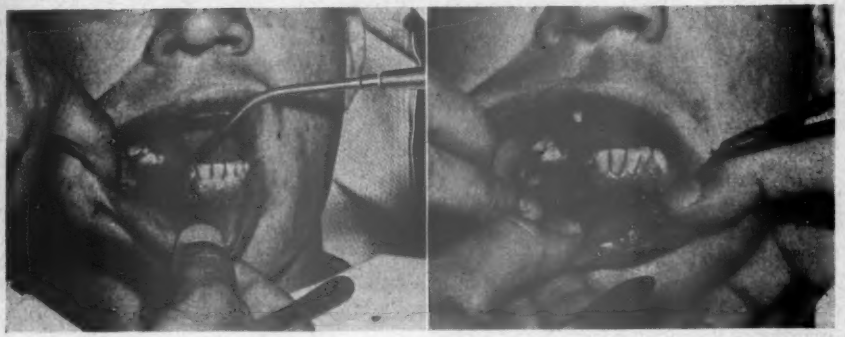

Fig. 3.—Left: Bone defect after removal of tumor. Right: Fibrin foam in place filling defect which was created by removal of the neoplasm.

per se, serves to restore contour lost by tissue excision, and also acts as a matrix for tissue reorganization. The incorporation of penicillin into the mass serves as a bacteriostatic, inhibiting clot breakdown through possible bacteriolysis. Thus, in combining these three agents, we hope to accomplish hemostasis, bacteriostasis and plastic restoration.

Report of Case

History.—A normal adult man, aged 23, complained of a hard swelling in the region of his missing lower right first molar (Fig. 1). The swelling extended from the cuspid to the second molar region, and from the alveolar crest to the mucobuccal fold. Tissue color was normal. The growth had been symptomless during the entire period of the six months that it had been noted by the patient.

Examination.—Roentgenographic examination revealed a multilocular area of radiolucency suggestive of multilocular cyst or adamantinoma (Fig. 2). A tentative roentgenographic and clinical diagnosis of adamantinoma was made.

Operation.—Under procaine anesthesia the lower right first and second bicuspids, the supporting bone of which showed roentgenographic evidence of neoplastic involvement, were removed. An incision was extended distally on the crest of the alveolar ridge from the second bicuspid socket to the mesial surface of the second molar. A generous flap was retracted, the

Fig. 4.—Wound sutured with fibrin foam in place.

overlying alveolar bone (of eggshell thickness) was removed, and the neoplastic mass exposed. The growth was completely enucleated, and there were several bony septa (Fig. 3, left) which divided the mass into lobulations. A thorough débridement was made and the bony defect filled with a mixture of human thrombin, penicillin (20,000 units) and saline solution incorporated in a matrix of fibrin foam (Fig. 3, right). The margins of the incision were then coapted with several sutures (Fig. 4).

Outcome.—The healing (Fig. 5) progressed uneventfully until the fifth day when the patient showed symptoms of discomfort including moderate swelling and pain which were indicative to us of some slight degree of tissue breakdown. On the fifth day four injections (each containing 20,000 units of penicillin) were given at two hour intervals directly into the remnant of the clot implant. The following day the patient was again asymptomatic and there was clinical evidence of healing. An uneventful recovery followed.

Fig. 5.—Wound three days after operation.

Pathologic Examination

Gross: The specimen is a piece of tissue approximately 30 by 50 mm. (Fig. 6). It is of irregular contour, and of translucent grayish-white glistening cross section. A few faint irregular streaks of more opaque white are seen alternating with pale gray very translucent dot-like zones. The tissues have a somewhat mucoid character. They are moderately firm in consistency.

Microscopic: Numerous sections of the mass are essentially similar. The tissues are composed of fibrous tissue of varying consistency (Fig. 7). Some portions show moderately dense collagenous fibers in wavy and fasciculated configuration. The individual fibers are separated by relatively clear spaces. In other portions the constituent fibers are more delicate,

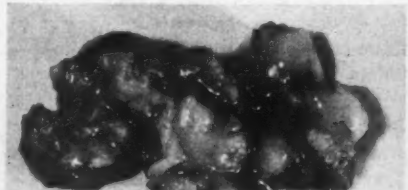

Fig. 6.—Measurement of a section of the tumor mass.

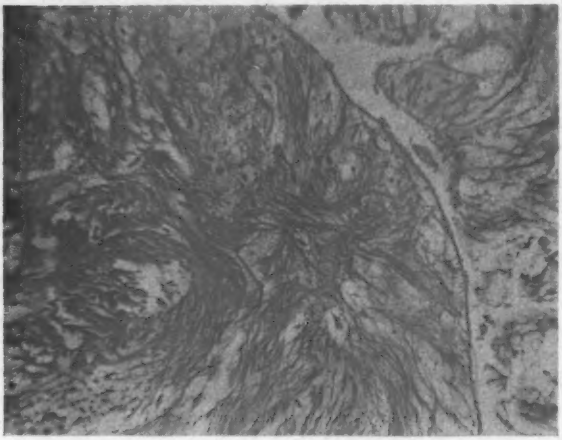

Fig. 7.—Photomicrograph of section of tumor mass.

irregular and branching in character, and separated by a blue-staining mucoid matrix. The mass is relatively poor in cells. The nuclei are rounded or slightly oval, and of benign appearance. Many of them resemble typical fibroblasts. In the more mucoid portion the cytoplasm appears definitely continuous with the branching eosinophilic threads and fibers. No epithelial elements are identified.

Final Diagnosis: Fibromyxoma of the mandible.

Note: Fat stains show complete absence of lipoid. There is no evidence of cartilage transformation. — *Davis-Monthan Field.*

THE FAMILY AND DENTAL DISEASE. IV. DENTAL DISEASE (DMF) EXPERIENCE IN PARENTS AND OFFSPRING*

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*The preceding papers in this series "The Family and Dental Disease" are: I. DMF Experience Among Husbands and Wives. J.A.D.A. 32:945, August 1, 1945; II. Age of Parents and Dental Caries (DMF) Experience in Offspring (in preparation); III. Size of Family and Dental Caries (DMF) Experience in Offspring (in preparation).

All dental examinations were obtained by Toyohara Shimizu, Dental Officer, Office of Indian Affairs, U. S. Department of Interior, with the assistance of a group of dentists resident in the Colorado River Relocation Center.

†Senior Dental Officer, Division of Public Health Methods, U. S. Public Health Service.

Jour. A.D.A., Vol. 33, June 1, 1946

Introduction

Familial influences in dental disease have not been clearly identified chiefly because of inadequate quantitative data. This situation has been summarized by Moore and Hughes[1]:

Many of the articles dealing with the role

1. Moore, G. R., and Hughes, B. O.: Familial Factors in Diagnosis, Treatment and Prognosis of Dentofacial Disturbances. Am. J. Orthodont. & Oral Surg. 28:603, October 1942.

of heredity . . . have been based on empirical and logical arguments and have been inadequately documented in their presentation of supporting evidence. . . . The problem of further research is to isolate specific attributes, to determine their mode of transmission, to acquire knowledge concerning their development and to understand how they are affected by the environment in which they must exist.

This quotation has specific reference to orthodontics, but it applies equally well to the dental caries problem. An abundance of literature containing opinion and logical inference directs attention to the probable importance of heredity in susceptibility to dental disease.[2-12] However, few reports contain direct observations. Denney[13] studied nine families comprising forty persons and concluded:

The character of our teeth is the product of our inheritance; the care we give them and the nature of the environment changed and modified as it is by acids, bacteria, and diet; but fundamentally our teeth are what they are because of our inheritance.

The observations of Denney on nine families are obviously insufficient to provide quantitative insight into the influence of hereditary factors in caries susceptibility. However, the genealogies presented are of considerable interest as examples of the type of information that will assist in the development of better knowledge in this field.

The present report provides material derived from direct observation of 5,400 persons in 1,150 families. The findings indicate that the amount of dental disease which appears in offspring is quantitatively related to that which has been experienced by their parents. The symbol "DMF" used in this report refers to teeth decayed, missing or filled.

The data are based on detailed dental (mirror and explorer) examinations of 5,400 persons of Japanese ancestry residing at the Colorado River Relocation Center of the War Relocation Authority. As a first step in the analysis, the 1,150 fathers were separated into groups according to age, each group covering an age span of 5 years. In each age group the fathers were placed in ascending order according to the number of DMF teeth that they had. In each age group approximately the first 30 per cent of the fathers were designated as of low DMF rate (the fewest DMF teeth for their age group), and the last 30 per cent were classified as having a high DMF rate (the most DMF teeth for their age group). The remaining 40 per cent in each age group were designated as having a "middle" DMF rate. The group of 1,150 mothers was divided similarly. (For a fuller description of the method, see the first report in this series.[14])

Among the 1,150 fathers, 334 were in

2. Abt, I. A.: Pediatrician's Views on Disorders of Teeth. J.A.D.A. 19:1133, July 1932.

3. Brash, J. C.: Etiology of Irregularity and Malocclusion of Teeth. London: Dental Board of the United Kingdom, 1931.

4. Casto, F. M.: Orthodontia and General Practitioner. Int. J. Orthodont. & Dent. for Children 21:803, September 1935.

5. Charles, S. W.: Environment, Heredity and Malocclusion. Int. J. Orthodont., Oral Surg. and Radiography 17:566, June 1931.

6. Davenport, C. B.: Genetical Factor in Dental Research. J. D. Res. 1:9, March 1919.

7. Guyer, M. F.: Abnormalities of Teeth and Jaws from Standpoint of Inheritance. Int. J. Orthodont., Oral Surg. & Radiography 10: 323, June 1924.

8. Johnson, A. L.: Constitutional Factor in Skull Form and Dental Occlusion. Am. J. Orthodont. & Oral Surg. 26:627, July 1940.

9. Mummery, S. P.: Heredity and Dental Diseases. British J. D. Sc. 51:680, 721, August 1908.

10. Nord, C. F. L.: Importance of Biology as Applied to Dentistry. D. Cosmos 58:297, March 1916.

11. Phillips, G. P.: Probable Primary Factors Controlling Occlusion. Int. J. Orthodont., Oral Surg. & Radiography 13:379, May 1927.

12. Steynor, Herbert: Constitutional Factor in Degeneration of Teeth. D. Digest 12:967, September 1906.

13. Denney, R. E.: Heredity and Its Influence on Teeth. D. Cosmos 72:596, June 1930.

14. Klein, Henry, and Shimizu, Toyo: Family and Dental Disease: I. DMF Experience Among Husbands and Wives. J.A.D.A. 32:945, August 1, 1945.

Table 1.--Number of Offspring Examined and Number of DMF Teeth Per Offspring, by Age and Sex of Offspring and by DMF Experience Level of Each Parent Considered Separately

DMF Experience Level of Parents	Age of Son (Years)						Age of Daughter (Years)					
	5-9	10-14	15-19	20-24	25-29	All Ages*	5-9	10-14	15-19	20-24	25-29	All Ages*
	Number of Offspring											
Both parents:												
All levels	303	379	482	245	55	1,464	320	402	482	253	39	1,496
Father:												
Low	71	97	144	69	17	398	99	112	156	80	13	460
Middle	146	160	193	99	17	615	127	163	175	90	16	571
High	86	122	145	77	21	451	94	127	151	83	10	465
Mother:												
Low	81	106	125	50	15	377	86	105	141	82	12	426
Middle	126	151	202	101	21	601	136	165	193	88	13	595
High	96	122	155	94	19	486	98	132	148	83	14	475
	DMF Teeth Per Offspring											
Both Parents:												
All levels	1.1	4.2	6.7	8.6	13.1	5.5	1.3	4.9	7.7	9.1	10.6	5.9
Father:												
Low	0.9	2.9	5.9	6.1	14.2	4.4	1.2	4.2	6.7	8.6	12.8	5.3
Middle	1.1	4.6	6.5	8.7	12.6	5.5	1.3	5.0	8.1	8.2	9.3	5.9
High	1.3	4.8	7.8	10.6	12.8	6.3	1.6	5.4	8.5	10.5	9.8	6.6
Mother:												
Low	1.0	2.6	5.1	7.4	9.5	4.2	1.1	3.8	5.5	7.2	7.8	4.4
Middle	1.1	4.7	6.9	7.7	15.2	5.4	1.3	4.7	7.8	8.6	11.0	5.8
High	1.3	5.1	8.5	10.2	13.7	6.6	1.5	6.0	9.8	11.6	12.6	7.4

*DMF rates are age adjusted.

the low DMF rate group, 469 were in the middle group and 347 were in the high group. Of the 1,150 mothers, 329 were in the low group, 470 were in the middle group and 351 were in the high DMF rate group.

Because of the division of mothers and fathers into three groups according to DMF rates (low, middle and high), nine categories of matings were encountered. Thus, among the 334 men with low DMF rates, 123 were married to women with low DMF rates, 129 to women with middle DMF rates and 82 to women with high DMF rates. Among the 469 men with middle DMF rates, 121 were married to women with low DMF rates, 202 to women with middle DMF rates and 146 to women with high DMF rates. Among the 347 men with high DMF rates, 85 were married to women with low DMF rates, 139 to women with middle DMF rates and 123 to women with high DMF rates. The number of offspring examined of fathers and mothers of particular DMF rates are given in the upper sections of Tables 1 and 2.

The primary purpose of the present report is to examine the relation between the DMF rates in the offspring and the DMF rates of the different categories of marital pairings.

Findings

DMF Experience of Offspring and DMF Experience of Each Parent Considered Separately. — The material in Table 1 shows the close relation between the caries experience of offspring and that of the mothers and fathers considered separately. For example, among sons of nearly every age, those who have fathers with low DMF rates have fewer teeth showing evidence of attack by caries that do those who have fathers with middle or high DMF rates, while sons of mothers with low DMF rates have fewer DMF teeth than do those of mothers with middle or high DMF rates. Thus sons 10-14 years old having fathers

Table 2.--Number of Offspring Examined and Number of DMF Teeth Per Offspring, by Age and Sex of Offspring and by DMF Experience Level of Both Parents Considered Simultaneously

DMF Experience Level of Parents		Age of Son (Years)						Age of Daughter (Years)					
Father	Mother	5-9	10-14	15-19	20-24	25-29	All Ages*	5-9	10-14	15-19	20-24	25-29	All Ages*
							Number of Offspring						
All Levels	All Levels	303	379	482	245	55	1,464	320	402	482	253	39	1,496
Low	Low	28	46	50	25	4	153	38	32	55	35	2	162
	Middle	31	31	59	26	7	154	41	47	58	27	4	177
	High	12	20	35	18	6	91	20	33	43	18	7	121
Middle	Low	29	34	48	13	5	129	23	43	46	27	7	146
	Middle	70	66	86	50	4	276	53	66	75	33	6	233
	High	47	60	59	36	8	210	51	54	54	30	3	192
High	Low	24	26	27	12	6	95	25	30	40	20	3	118
	Middle	25	54	57	25	10	171	42	52	60	28	3	185
	High	37	42	61	40	5	185	27	45	51	35	4	162
							DMF Teeth Per Offspring						
All Levels	All Levels	1.1	4.2	6.7	8.6	13.1	5.5	1.3	4.9	7.7	9.1	10.6	5.9
Low	Low	1.0	1.9	4.4	6.7	12.0	3.7	0.9	3.4	4.8	6.8	4.5	3.9
	Middle	1.1	3.7	5.7	4.8	15.4	4.4	1.2	3.8	6.7	8.1	15.2	5.2
	High	0.3	4.1	8.2	7.2	14.2	5.6	1.6	5.4	9.0	12.9	13.7	7.2
Middle	Low	0.8	2.6	4.7	5.8	0.6	3.6	1.2	3.8	5.5	7.0	7.9	4.4
	Middle	1.1	4.9	6.4	8.1	11.2	5.4	1.2	5.0	8.3	8.6	9.8	6.0
	High	1.3	5.4	8.1	10.7	17.0	6.8	1.5	6.0	9.9	8.9	11.7	6.9
High	Low	1.0	3.9	7.1	10.6	10.3	5.7	1.5	4.3	6.6	8.0	9.7	5.2
	Middle	1.0	5.0	6.8	10.1	16.7	6.1	1.7	5.1	8.1	9.1	7.7	6.1
	High	1.7	5.0	9.1	11.0	7.8	6.8	1.6	6.6	10.5	13.1	11.5	8.0

*DMF rates are age adjusted.

with low DMF rates average 2.9 DMF teeth, while sons of the same age having fathers with high DMF rates average 4.8 DMF teeth. For all ages combined, sons of fathers with low DMF rates average 4.4 DMF teeth, sons of fathers with middle DMF rates average 5.5 DMF teeth, while sons of fathers with high DMF rates average 6.3 DMF teeth. Among sons 10-14 years of age, those of mothers with low DMF rates average 2.6 DMF teeth, those of mothers with middle DMF rates average 4.7 DMF teeth, while those of mothers with high DMF rates average 5.1 DMF teeth. For all ages combined, sons of mothers with low DMF rates average 4.2 DMF teeth, those of mothers with middle DMF rates average 5.4 DMF teeth, while sons of mothers with high DMF rates average 6.6 DMF teeth.

In like manner, the DMF level of the daughter is related to the DMF level of each parent. Thus, for all ages combined, daughters of fathers with low DMF rates average 5.8 DMF teeth, those of fathers with middle DMF rates average 5.9 DMF teeth and those of fathers with high DMF rates average 6.6 DMF teeth. Daughters (all ages combined) of mothers with low DMF rates average 4.4 DMF teeth, those of mothers with middle DMF rates average 5.8 DMF teeth and those of mothers with high DMF rates average 7.4 DMF teeth.

DMF Experience of Offspring and DMF Experience of Both Parents Considered Simultaneously.—The data on the DMF experience of the offspring may be better analyzed in terms of the DMF levels of the mother and father together (Table 2). The highest DMF experience in offspring is found when both the mother and the father have high DMF rates. Approximately midrange DMF experience is found in offspring when the mother and the father both have middle DMF rates. The lowest DMF experience is encountered in children whose parents both have low DMF rates.

Like-Mating of Parents.—The marked differences among offspring of like-mat-

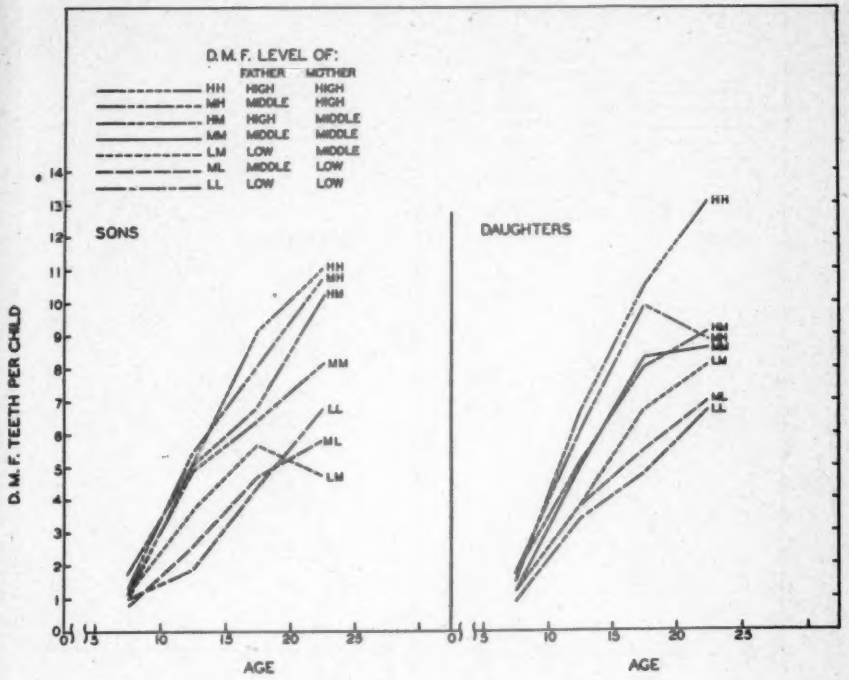


Fig. 1.—Relation between DMF levels of sons and daughters and DMF levels of fathers and mothers, by age of offspring.

ings at different DMF levels are apparent for every age of offspring, as shown in Figure 1. For the ages 10-14 years, sons of mothers and fathers with low DMF rates average about 2.0 DMF teeth, and the daughters at the same ages average 3.4 DMF teeth. In contrast, at the same ages, sons of mothers and fathers with high DMF rates have 5.0 DMF teeth, nearly three times as many as sons of parents with low DMF rates. Daughters of mothers and fathers with high DMF rates average about 6.6 DMF teeth, or almost double the number found in daughters of parents with low DMF rates. For the age group 20-24 years, sons of mothers and fathers with low DMF rates average about 7 DMF teeth, those of mothers and fathers with middle DMF rates average about 8 DMF teeth, while sons of parents with high DMF rates average 11 DMF teeth. For daughters aged 20-24 years, the corresponding numbers of DMF teeth are about 7, 9 and 13, respectively.

Unlike-Mating of Parents.—When the DMF level of the mother is low, differences in the DMF level of the father are related to the DMF experience of daughters to only a small extent. On the other hand, when the DMF level of the father is low, differences in the DMF level of the mother are related to the DMF experience in daughters to a rather marked extent. For example, among daughters 15-19 years of age having mothers with low DMF rates, those having fathers with high DMF rates average only about 2 more DMF teeth than those having fathers with low DMF rates. In contrast,

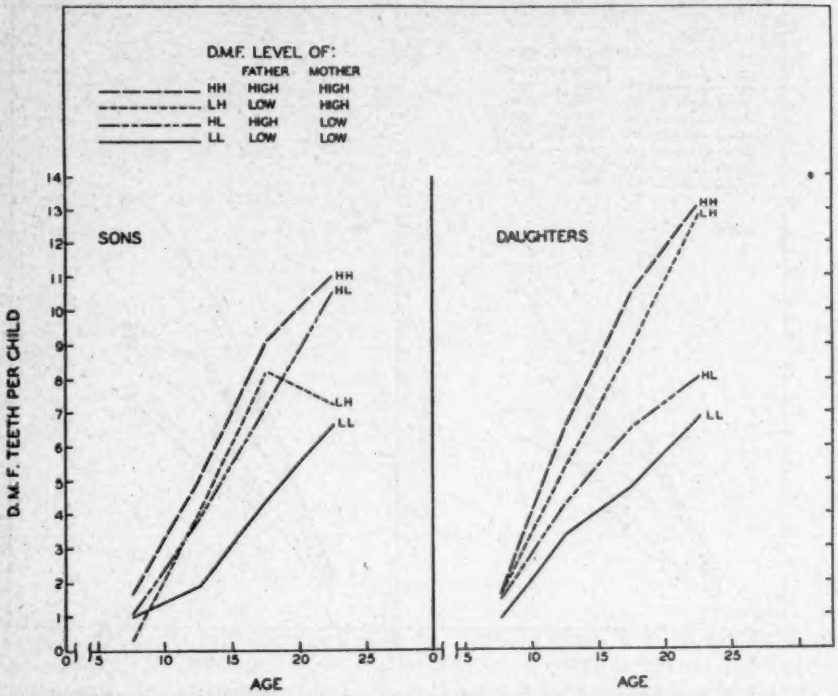
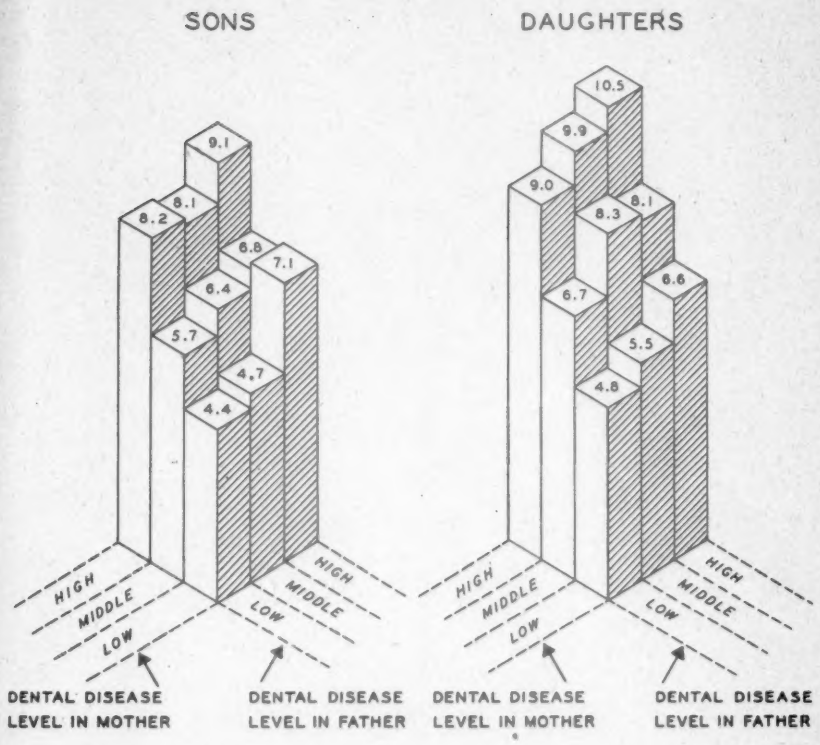


Fig. 2.—Relation between DMF levels of sons and daughters and DMF levels of fathers and mothers, by age of offspring.

among daughters of the same age having fathers with low DMF rates, those having mothers with high DMF rates average in excess of 4 more DMF teeth than the daughters of mothers with low DMF rates. The DMF level of the father has only a slight positive relation to the DMF experience of the daughter if the mother has a middle DMF rate. In contrast, the DMF level of the mother has a consistent and marked relation to the DMF experience of the daughter if the father has a middle DMF rate.

The DMF level of the father is closely related to the son's DMF experience if the DMF level of the mother is low. If the DMF level of the father is low, the DMF levels of mother and son are also closely related. Broadly considered, the effect of the DMF level of the mother on the DMF level of the son is about equal to that of the father when one parent has a low and the other a high DMF rate. This finding is in rather sharp contrast to that encountered among daughters, for the DMF level of the mother is more closely related to the DMF level of the daughter than is that of the father.

When the mother is of middle DMF level, the DMF level of the father is related to the DMF experience of the son only to a small extent, but when the father has a low DMF rate, the DMF rate of the mother has a much more pronounced relation to the DMF rate of the son. Thus the relation of DMF rates in sons and parents when one parent has a middle DMF rate and the other parent has either a high or a low DMF rate is



NUMBERS ON TOPS OF COLUMNS REPRESENT NUMBER OF DMF TEETH PER SPECIFIED OFFSPRING, AGES 15 - 19 YEARS.

Fig. 3.—Relation between DMF levels of sons and daughters aged 15-19 years and DMF levels of fathers and mothers.

similar to that found in daughters of similar parent combinations.

For sons of any age, the relation to the parent with a high DMF rate predominates. Hence, when the mother has a high DMF rate, change in the DMF rate of the father from high to low results in a DMF experience in male offspring which is only a little lower than that of the male offspring of mothers and fathers with high DMF rates. Similarly, when the father has a high DMF rate, change in the DMF rate of the mother from high to low has only a slight relation to the DMF experience of the male offspring. In this particular type of parent combination, the relation of the son's DMF rate to the DMF rate of the mother is perhaps a little stronger than the relation to the DMF rate of the father (Fig. 2).

The relation between the DMF rates of mothers and fathers and the DMF experience of their sons and daughters 15-19 years old is summarized in Figure 3. The marked and consistent tendency for children to reflect, in their own caries experience rates, the DMF experience

already demonstrated by their parents is clearly shown.

Discussion

The remarkably consistent way in which the DMF experience of offspring is related to the DMF levels of parents makes it difficult to exclude the view that dental disease susceptibility in children involves strong familial vectors which very likely have a genetic basis, perhaps sex-linked.

It has been fairly well demonstrated that familial susceptibility is of significance in a number of diseases. For example, among more than 2,000 children of 587 couples, Aycock[15] found that 7 per cent of the children showed leprosy when the father alone was a leper, 14 per cent when only the mother had the disease and 26 per cent when both parents had leprosy. In discussing these findings, Puffer[16] suggests that two factors are necessary for transmission of the disease: infection plus familial susceptibility.

Ciocco and co-workers[17-19] have shown that the siblings, parents, grandparents, uncles and aunts of rheumatic children are affected with rheumatic fever or its manifestations more frequently than are the relatives of non-rheumatic children. These workers also found rheumatic children more often when the mother had a rheumatic condition than when the father had such a condition. Also, rheumatic conditions were found more frequently in females than in males, findings which led these workers to suggest that hereditary constitution may be a factor in determining predisposition to rheumatic conditions and that the hereditary transmission may be sex-linked.

Aycock[20] has shown that, of 586 poliomyelitis patients in New England, 157, or 26.8 per cent, had one or more relatives residing outside the household who had had the disease, whereas, among 100 controls, only 5 per cent had one or more relatives with a history of such infection. Hence, certain persons seem to have a particular vulnerability to infection and these persons are members of susceptible families.

Familial Susceptibility

A considerable volume of epidemiologic investigation in tuberculosis indicates that in this disease also familial susceptibility plays an important role.[16, 21-25]

There is general agreement that susceptibility and resistance to disease in lower animals also are determined to an

15. Aycock, W. L.: Familial Susceptibility to Leprosy. Am. J. M. Sc. 201:450, March 1941.

16. Puffer, Ruth R.: Familial Susceptibility to Tuberculosis. Cambridge, Mass.: Harvard University Press, 1944.

17. Gauld, R. L., and Read, F. E. M.: Studies of Rheumatic Fever: III. Familial Association and Aggregation in Rheumatic Disease. J. Clin. Investigation 19:393, March 1940.

18. Gauld, R. L.; Ciocco, A., and Read, F. E. M.: Further Observations on Occurrence of Rheumatic Manifestations in Families of Rheumatic Patients. Milbank Mem. Fund Quar. 17:263, July 1939.

19. Read, F. E. M.; Ciocco, A., and Taussig, H. B.: Frequency of Rheumatic Manifestations Among Siblings, Parents, Uncles, Aunts, and Grandparents of Rheumatic and Control Patients. Am. J. Hyg. 27:719, May 1938.

20. Aycock, W. L.: Familial Aggregation in Poliomyelitis. Am. J. M. Sc. 203:452, March 1942.

21. Kallmann, F. J., and Reisner, D.: Twin Studies on Significance of Genetic Factors in Tuberculosis. Am. Rev. Tuberc. 47:549, June 1943.

22. Long, E. R.: Constitution and Related Factors in Resistance to Tuberculosis. Arch. Path. 32:122, July 1941; 286, August 1941.

23. Pearson, K.: Tuberculosis, Heredity and Environment. London: Cambridge University Press, 1912.

24. Stocks, P., and Karn, M. N.: Fresh Evidence on Inheritance Factor in Tuberculosis. Ann. Eugenics 3:84, April 1928.

25. Wolff, G., and Ciocco, A.: Infection, Social Environment and Heredity in Tuberculosis as Measured by Mortality Studies in Husbands and Wives, Brothers and Sisters. Am. Rev. Tuberc. 46:142, August 1942.

important degree by inherited constitutional characteristics.[26-28]

The investigations described in this report provide another example, in the dental field, of familial susceptibility. Hunt and co-workers[29] have demonstrated recently that hereditary factors play a role in dental caries in rats. Earlier work among human beings has shown that brothers and sisters of highly susceptible children have twice as much caries experience as do brothers and sisters of caries-resistant children.[30] The present study carries the familial analysis of dental caries one step further to include the parents. The findings demonstrate strong familial factors in susceptibility and resistance to dental disease. The data available are sufficient to provide additional analyses directed toward more detailed identification of the genetic mechanisms involved. The findings in these directions will be described in following papers in this series of reports.—*U. S. Public Health Service.*

26. Lurie, M. B.: Heredity, Constitution and Tuberculosis: An Experimental Study. Am. Rev. Tuberc. 44:1, September 1941.

27. Webster, L. T.: Inheritance of Resistance of Mice to Enteric Bacterial and Neurotropic Virus Infections. J. Exper. Med. 65: 261, February 1937.

28. Wright, S., and Lewis, P. A.: Factors in Resistance of Guinea Pigs to Tuberculosis, with Especial Regard to Inbreeding and Heredity. Am. Naturalist 55:20, January-February 1921.

29. Hunt, H. R.; Hoppert, C. A., and Erwin, W. G.: Inheritance of Susceptibility to Caries in Albino Rats. J. D. Res. 23:385, October 1944.

30. Klein, Henry, and Palmer, C. E.: Studies on Dental Caries: V. Familial Resemblance in Caries Experience of Siblings. Pub. Health Rep. 53:1353, August 5, 1938.

TESTIMONY OF THE AMERICAN DENTAL ASSOCIATION ON WAGNER-MURRAY-DINGELL BILL (S. 1606)

A stenographic report of the testimony given by officials of the American Dental Association at hearings before the Senate Committee on Education and Labor on the Wagner-Murray-Dingell bill, S. 1606, is published below. The hearings were held in Washington, D. C., April 23, with the following officials of the American Dental Association in attendance: Carl O. Flagstad, chairman, Committee on Legislation; Allen O. Gruebbel, executive secretary, Council on Dental Health; Leslie M. FitzGerald, chairman, Committee on Economics; Lon W. Morrey, director, Bureau of Public Relations; Harold Hillenbrand, editor, THE JOURNAL; George H. Fox, general counsel, and secretary, Committee on Legislation; Herbert B. Bain, director of press relations; Joseph E. Bagdonas, secretary, Committee on Economics.

Senator James E. Murray, Montana, chairman of the Senate Committee on Education and Labor, Senator Forrest C. Donnell, Missouri, and Senator Allen J. Ellender, Louisiana, were present during the hearings.

The Chairman: Dr. Flagstad, you may give your full name.

Dr. Flagstad: I am Dr. Carl O. Flagstad of Minneapolis, chairman of the Committee on Legislation of the American Dental Association. I have been engaged in private dental practice for thirty-five years and am a professor and chairman of the Division of Prosthetic Dentistry at the University of Minnesota.

I desire to present a statement on behalf of the members of the American Dental Association in reference to S. 1606. I also wish to express the appreciation of our Association for this opportunity to present its views in the interests of improving dental health in this nation.

In order to conserve time, the viewpoint

of the American Dental Association has been summarized into a single statement. We request the privilege of inserting supportive technical data into the records so that the additional information may be available to members of this committee and to other members of the Senate. The American Dental Association has in attendance at this hearing various officers, committee members and technical consultants all of whom will be pleased to provide further information, if it is desired, at the finish of this presentation. These men have long studied various plans for improving the dental health of our people and, therefore, are qualified to speak with authority.

The American Dental Association presents its statement under the following headings:

I. The American Dental Association and its objectives.
II. The American Dental Association's attitude toward health security as shown by its past record.
III. The American Dental Association's concept of the basis for a Dental Health Program.
IV. The American Dental Association's attitude toward S. 1606, especially the dental sections.
V. The American Dental Association's proposed Dental Health Program and the dental provisions of S. 1606.
VI. The American Dental Association's Recommendations.

I. The American Dental Association

The American Dental Association, whose headquarters are in Chicago, has a membership of 56,000 dentists. This represents more than two-thirds of the 75,000 dentists registered in the United States. The Association has fifty-eight constituent societies comprising all of the forty-eight states, each territory and possession, the Army, the Navy, the U. S. Public Health Service and the Veterans Administration. Within the constituent societies there are 440 organized district dental societies located in all parts of our country, and each of these constituent societies annually selects delegates to send as voting members to sessions of the House of Delegates, the policy-making body of the American Dental Association.

The Committee on Legislation, of which I am chairman, has its members elected by the House of Delegates and we serve without personal remuneration.

This democratic pattern of organization with extensive membership in every state of the Union, unquestionably gives the American Dental Association the right to voice the opinion of the great majority of the dentists in the United States. The objectives of the Association are in the interest of the public welfare.

II. The American Dental Association's Attitude Toward Health Security Legislation

The American Dental Association has always been willing to cooperate in every worthy effort leading to the development of sound legislation for the improvement of the general and dental health of our people. The objectives of our Association and its fifty years of actual achievement attest the fact that we have continually endeavored to promote dental health programs. Through the efforts of our Association and its constituent societies, dental divisions have been established in forty-four out of the forty-eight State Health Departments; dental health programs, particularly for children, have been established in hundreds of cities and counties and dental health education and dental research have been extensively stimulated and fostered.

In 1939 when legislation similar to S. 1606 (the first Wagner Health Bill, S. 1620) was pending before this committee, the Association expressed itself as being in accord with the general objectives of such legislation. The Association, at the request of the Senate Committee, prepared at that time a series of amendments incorporating its suggestions for the development of a national program for dental health. In the intervening seven years the American Dental Association has consistently pressed for federal legislation which would translate this program into reality.

On two occasions prior to 1945, in cooperation with the kind help of the chairman of this very committee, Senator Murray, the American Dental Association sponsored the introduction of bills into Congress to initiate its program on a national scale by intensifying dental research. These bills were reported favorably by the committee, but did not proceed to full legislative enactment.

In 1944 the Association again called attention to the need for legislation at the national level and adopted four principles outlining a

practical basis for such a program. The four principles are as follows:

1. Research: Adequate provisions should be made for research which may lead to the prevention or control of dental diseases.

2. Dental Health Education: Dental health education should be included in all basic educational and treatment programs for children and adults.

3. Dental Care: (a) Dental care should be available to all regardless of income or geographic location. (b) Programs developed for dental care should be based on the prevention and control of dental diseases. All available resources should first be used to provide adequate dental treatment for children and to eliminate pain and infection for adults. (c) Dental health is the responsibility of the individual, the family, and the community, in that order. When this responsibility, however, is not assumed by the community, it should be assumed by the state and then by the federal government. The community in all cases shall determine the methods for providing service in its area.

4. In all conferences that may lead to the formation of a plan for dental research, dental health education and dental care, there should be participation by authorized representatives of the American Dental Association.

The American Dental Association again in 1945, in keeping with its record of seeking sound legislation for a national dental health program, sought the introduction of bills to translate this program into reality. Through the cooperation of Senator Murray, Senator Pepper and Senator Aiken, all members of this committee, two bills were introduced into the Senate. S. 190 proposes a federal appropriation for the erection of a National Institute for Dental Research as a part of the National Institute of Health at Bethesda, Md., and for providing grants-in-aid to public and private agencies for the intensification of dental research. S. 1099 proposes a federal system of grants-in-aid to the states for the development of experimental programs in all phases of dental health education, dental treatment and dental administration. Both bills provide that administration at the federal level would be in the hands of the U. S. Public Health Service, Federal Security Agency. A subcommittee of your group under the chairmanship of Senator Pepper held a most favorable hearing on these bills in June 1945.

III. The American Dental Association's Concept of the Basis for a Dental Health Program

In legislation of the type of S. 1606, there has been a tendency to include dental practice and treatment under the categorical head of "medical service." It is true that close cooperation between dental and medical practitioners exists in routine and special practice, but it does not follow that the needs and program of both professions are identical. There are some specific facts about dental disease and dental practice, which must be taken into consideration before an intelligent and long-range program can be planned. It is impossible to present these facts in detail in our allotted time so that I have taken the liberty of presenting a summary of them. Additional evidence will be placed in the record to support the various contentions.

1. Dentistry must include in its program provisions for treating a disease that is almost universal. It is almost axiomatic that 95 per cent of our population suffer from dental diseases at some point or other in life and that an extremely high percentage need annual dental care.

2. Because of the extremely high prevalence of untreated dental defects, it is impossible to apply the insurance principle.

3. The real causes of the chief dental diseases, dental caries and periodontoclasia, are not known so it is impossible to prevent them in the true sense of the word by attacking the cause. The best methods of control that are known to date are early and regular dental treatment.

4. If such early dental treatment is not sought, the ensuing dental neglect becomes much more costly than timely dental treatment.

5. If early and regular dental treatment can be given to children, it will assure a definite lowering of serious dental defects later in life and the production of a generation of adults comparatively free from the accumulated defects caused by early neglect.

6. The cost of providing such essential dental service for children is, according to present estimates, less than one-half the cost of providing essential dental service for adults.

7. Since many people do not seek dental care until great damage has occurred, it is absolutely essential to maintain a continuing

program of dental health education to inform all of the importance of dental health and to motivate them to secure dental care.

8. Because of the limited number of dentists, it is impossible to carry out any program that promises complete dental care to both children and adults.

9. In the face of this dental personnel problem, it is obvious that the most efficient use should be made of the present number of dentists. It is the opinion of competent dental authorities that in public dental health programs the most efficient use of available dental services is to devote all needed attention to dental disease in children and provide additionally as much service as possible for adults.

10. One of the reasons for dental neglect besides those already mentioned is that the prevention and control of dental diseases have never been the object of continuing well-supported funds from either public or private agencies.

All of these factors are brought to your attention to demonstrate that legislation even if it may be well designed to meet medical problems and conditions is not necessarily as well adapted to meet dental problems which are quite different in nature. The attitude of the American Dental Association toward the current bill, S. 1606, is based largely on the fact that it does not take into sufficient account the unique complex problem of providing adequate dental care.

IV. The American Dental Association's Attitude Toward S. 1606

The American Dental Association is opposed to the enactment of S. 1606 because:

1. The American Dental Association believes that compulsory health insurance for a majority of the population should not be established in this country without preliminary scientific experimentation involving less extensive groups of the population.

2. The American Dental Association believes that it is unsound administration to disperse responsibility for health among the three agencies mentioned by the bill: the U. S. Public Health Service, the Children's Bureau of the Department of Labor and the Social Security Board.

3. The American Dental Association believes that a compulsory health insurance system, basically similar to those in effect in foreign countries, should not be established on a national basis until there is incontrovertible evidence that the American pattern is an improvement and that the errors of the foreign systems will not be perpetuated in the American program.

4. The American Dental Association believes that a program the size of the one proposed should not be established without directly facing the problem of expense. This expense should be clearly enunciated in terms of both cost to the individual and cost to the nation.

5. The American Dental Association believes that the grants-in-aid system has been effective in meeting certain health needs under the Social Security Act. The American Dental Association believes that this system should be enlarged to meet all health needs and that there is no necessity for enacting a national compulsory prepayment plan.

6. The American Dental Association believes that the right of a state to determine the methods of meeting its health needs should not be taken away.

7. The American Dental Association believes that a program as comprehensive as the one proposed should not be designed without seeking the official cooperation of all agencies and professions involved.

These are general statements, but time does not permit the documentation of each one.

Attitude of the American Dental Association Toward the Dental Sections of S. 1606

The dental provisions of S. 1606 have been examined more minutely and the reactions of the profession are recorded in greater detail because of the American Dental Association's particular interest in the dental problem.

The primary objective of the dental profession is to prevent and control dental diseases through the application of sound dental and public health practices. S. 1606 is in direct conflict with this objective.

In the early development of dentistry, patients received little more than emergency types of dental service consisting largely of relief of pain, extraction of teeth and treatment of acute infection. In the light of modern dental practice, these dental services constitute only a small part of the routine dental treatment necessary for the protection of dental health. By no stretch of the imagination can such limited services form the basis for a national dental health program, yet only

these primitive services are promised to the American people by S. 1606.

Some may be inclined to argue that in years to come the present restricted content of dental benefits proposed by the bill would be enlarged to include more than examination, diagnosis, prophylaxis, extractions and special treatments. Even if such a possibility exists, which may be doubted in the face of experience abroad, there is still the undeniable fact that a large segment of the American people will be compelled to pay a tax for dental services which they cannot receive under a national insurance plan because of limitations on dental personnel.

S. 1606 proposes to make emergency dental care available to larger groups of the population. This proposal involves a false concept in public dental health practice because if only emergency dental treatment is given, the problem of dental disease will be as great ten or fifty years from now as it is today. In contrast to this uneconomic and unscientific approach, the dental profession of this country supports the view that the problem can be solved through a coordinated program of disease prevention and dental care for children. The reasons behind this belief are realistic and practical; if we cannot prevent the occurrence of dental disease, we must concentrate our efforts on dental research; if we cannot provide services to all persons (which is obviously the case) the benefits of the plan must be limited to the age groups in which dental disease begins.

The American Dental Association and the dental profession at large are of the opinion that no dental care program can be successful if its content is severely restricted in terms of dental service. To illustrate this point, a comparison should be made between S. 1606 and the dental care plan for low income groups proposed by the Council on Dental Health of the American Dental Association.

S. 1606 provides that dental benefits shall have such restricted content as the Surgeon General may determine: "provided, that on and after July 1, 1947, the restricted content of general dental or special dental benefit shall include at least (1) examination (including x-ray survey) and diagnosis; (2) prophylaxis; (3) extraction of teeth which are considered by the dentist and an attending physician to be or likely to be injurious to the general health of the individual; and (4) treatment of acute diseases of the teeth, their supporting structures, and adjacent parts, including fractures of the teeth or jaws."

Contrast this limited, emergency type of program in S. 1606 with that proposed by the Council on Dental Health; for the 12-18 year age group.

1. Examination using posterior bitewing radiograms at least once a year and other radiograms as may be needed.

2. Prophylaxis at intervals depending on patient need and susceptibility.

3. Restoration of carious teeth with silver amalgam, silicate cement and gold.

4. Pulp treatments including pulp capping, pulpectomy of vital exposed pulps and treatment of putrescent teeth in young patients.

5. Restoration and appliances including prosthetic restorations to replace missing teeth and appliances to maintain space so as to prevent malocclusion.

6. Treatment of mouth infection.

7. Extraction of infected teeth, supernumerary teeth, impacted teeth using local or general anesthesia.

8. Surgery as may be necessary to maintain health including, if necessary, root resection of infected permanent teeth.

9. Health education of the patient.

Authorities in the field of dentistry have agreed after a careful study that the services listed above would be considered minimum services for the protection and maintenance of dental health. Any amount less than that would be inconsistent with modern dental practice.

The vast difference in dental benefits of the two proposals emphasizes again the need for technical advice in planning health legislation. Such advice obviously was not sought or taken into account in drafting the dental provisions of S. 1606.

There are other valid reasons for seriously questioning the dental benefits in the proposed legislation. S. 1606 provides, for example, that every insured person will be entitled to receive "treatment of acute diseases of the teeth. . . ." A careful reading of the bill does not disclose what is meant by the term, "acute diseases of the teeth." If dental decay is an "acute disease" of the teeth, and many authorities believe that it should be so classified, then the bill promises that all types of dental procedures for treating diseased

teeth would be included in the plan, and only prosthetic dentistry would be excluded. Under this provision, the American people would not know the amount of dental health service to which they would be entitled. Such vague and indefinite wordings constitute a basic objection to the proposal.

The American Dental Association also wishes to raise another objection to the dental provisions of S. 1606. Experience in foreign countries reveals that effective dental health programs have not been developed under the compulsory health insurance system.

The following short quotations are taken from the report of an official committee of Parliament appointed to study the British dental program:

"Roughly two-thirds of the insured population, that is, between thirteen and fourteen million people are entitled to dental benefit, but only 800,000 (less than 7 per cent) of these claim it on an average each year."

It is the contention of the American Dental Association that there is something intrinsically wrong with a program which compels thirteen or fourteen million people to contribute for a service which only 800,000 receive.

"The state of the dental health of our population is bad and its effect on their general health is bad."

The American Dental Association does not believe that any program which must make such an admission after several decades of existence gives any indication that it will aid in rearing a generation of adults more free from dental disease.

Perhaps it might be impressive to add the general opinion expressed by our veterans of the Dental Corps stationed in England during the war. Their opinion is, "The dental health of the people of England is very poor and so is their dentistry."

V. The American Dental Association's Proposed Dental Health Program and the Dental Provisions of S. 1606

The American Dental Association would be reluctant to end its testimony with mere opposition to the proposal that is now before this committee. So intense have been the interest and activity of the American Dental Association in this great problem of better dental health for our people that it has sponsored two measures which are also pending before this committee: S. 190 and S. 1099. These bills provide, as has been stated, federal grants-in-aid for intensified dental research and experimental programs in all phases of dental health education and care. The advantages of this legislation over that proposed by S. 1606 are summarized in these conclusions:

1. Unlike S. 1606, the two bills make use of a well-tried and successful method of providing federal aid to the states, a method that has proven to be the successful basis of the Social Security Act: grants-in-aid.

2. Unlike S. 1606, the two bills give the states and communities the right, within broad limits, to determine their needs and programs for themselves. This right is traditional in this country. Since the needs differ in various states, so will the programs differ.

3. Unlike S. 1606, the two bills propose an experimental approach to this great problem on which much evidence is still lacking. This experimental approach can be as broad and as extensive as existing personnel and funds permit.

4. Unlike S. 1606, the two bills will place major emphasis upon prevention and control of dental disease, rather than on treatment. The two bills are designed to prevent disease rather than to repair its ravages.

5. Unlike S. 1606, the two bills do not promise something which cannot be delivered.

6. The two bills will encourage the development of new dental resources to meet the problem instead of restricting those already in existence by a monotonous program of primitive dentistry that has little beginning and no ending.

This series could be continued at greater length, but I believe the point has been made; the American Dental Association is opposed to the enactment of S. 1606 because it is not good legislation for improving dental health. In its proposal, American dentistry has offered a carefully planned solution which will make lasting contributions to dental health in this country.

VI. The American Dental Association's Recommendations

The American Dental Association recommends that S. 1606 should not be enacted.

The American Dental Association recom-

mends the immediate passage of S. 190 and S. 1099.

The American Dental Association again wishes to express its appreciation for the privilege of appearing before this Committee, and especially do we wish to thank Senator Murray for his many kindnesses to dentistry in the American Dental Association. He has been extremely kind in assisting the dental profession in its development. We shall be pleased to answer any question or supply further information at this time.

Thank you.

The Chairman: Thank you, Doctor, for your able statement. We will probably wish to ask a few questions.

The American Dental Association has issued a statement of Principles of the House of Delegates of the American Dental Association.

I ask you if what I read here are not the principles of the Association:

"One: Research: Adequate provisions should be made for research which may lead to the prevention or control of dental diseases."

That is one of the main principles of your Association?

Dr. Flagstad: Yes.

The Chairman: You have been kind enough to invite me on many occasions to sit with the representatives of your association with a view of preparing legislation to carry out that idea.

Dr. Flagstad: That is right, Senator.

The Chairman: And at your suggestion and the suggestion of your organization, I have filed, some years back, a bill to provide for research in the study of dental diseases.

Dr. Flagstad: That is right, Senator.

The Chairman: And subsequently other bills which have been mentioned here today have been filed and are now pending. S. 190, I believe, is one of them, and S. 1099 is another.

Dr. Flagstad: That is right.

The Chairman: Now, the other principles that I have reference to here are as follows:

"Dental Health Education: Dental health education should be included in all basic educational and treatment programs for children and adults."

That is another essential principle of your organization?

Dr. Flagstad: That is right.

The Chairman: Which I believe we all recognize.

Then you have a third principle, entitled: "Dental Care."

"Dental care should be available to all regardless of income or geographic location. Programs developed for dental care should be based on the prevention and control of dental diseases. All available resources should first be used to provide adequate dental treatment for children and to eliminate pain and infection for adults. Dental health is the responsibility of the individual, the family, and the community, in that order. When this responsibility, however, is not assumed by the community, it should be assumed by the state and then by the federal government. The community in all cases shall determine the methods for providing service in its area."

Those are the principles of your organization, Doctor?

Dr. Flagstad: That is right, Senator.

The Chairman: Now, you recognize that there is a grave shortage of practicing dentists in this country and that with the present force of dental practitioners, it would be impossible to give the American people full and complete dental care?

Dr. Flagstad: Right, sir.

The Chairman: Of course, the fact is that the dental practitioners have been kept busy with people who are able to pay adequately for the treatment they receive, but if dental care was opened freely to the American people, of course, there would not be sufficient dentists to take care of them at all.

Dr. Flagstad: That is right.

The Chairman: Most people neglect their teeth and as the result permit the diseases to advance in them to such a degree that finally it becomes an expensive matter to treat them, and that is the situation with the great majority of the American people in this country today, is it not?

Dr. Flagstad: To a certain extent, Senator, what you say is true. People neglect the care of their teeth for a number of reasons. One of them may be financial. It may be that they are not motivated. We hope to have a dental education program that will motivate them to the care, and we hope to begin with the children and have an adequate program, and

through education they will take care of their teeth, and so we will prevent some of these ravages that occur in later life.

The Chairman: I agree with you fully, and that is the reason why I was induced to file the legislation which your association proposed.

Dr. Flagstad: We are very grateful to you, Senator.

The Chairman: It is very obvious that if we could take care of the children of the country and educate them in the early years with reference to the need for dental care, we would put them in a position where, if they continued that care through their lives, they would be less likely to be required to go into any extensive dental treatment in later years.

Of course, I suppose under our modern system of living it is impossible in this country without continual dental investigation and treatment?

Dr. Flagstad: That is the hope of dental research, Senator. That is why we are intensifying research.

The Chairman: You think dental research would reveal certain methods and practices that could be followed in this country which would give the American people better teeth?

Dr. Flagstad: I believe there is some hope. Changing the habits of people is difficult, as you know.

The Chairman: I remember when I filed that legislation, I received letters from all over the country, not from dentists or physicians, but from individuals.

Among others I got a letter from a man who was a noted explorer, and he told me that a large cause or an important cause of dental decay in people of this country was due to the fact that their diet was not proper, and he told me he was in Iceland where they had made investigations and by digging up the graves of people that had been buried for several hundred years, they found that there were people there apparently 100 years old who still had their teeth because they lived on a meat diet, and that he thought that the good teeth of those people was largely due to the fact that they did not eat the kind of food we eat in this country.

So as the result of that investigation, you think it might be revealed that some of our trouble is due to a defective diet?

Dr. Flagstad: I believe that diet is quite a factor. There are many other factors, however.

The Chairman: In addition to that, cleanliness of the teeth, careful treatment of the teeth in the early periods of life would be effective in preserving good teeth?

Dr. Flagstad: That is right, Senator.

The Chairman: Now, you do not think that any effort should be made to bring dental care into this national health program that is envisaged by this bill, this S. 1606?

Dr. Flagstad: Unless it could be brought in as we are providing it in S. 190 and S. 1099.

The Chairman: Well, yes. I approve of that legislation, of course, and hope that it will be enacted. I do not think anyone could oppose that legislation if they understood it.

Dr. Flagstad: The hearing was very favorable, Senator, as you will recall.

The Chairman: Yes. The National Health Service is, of course, in favor of it, and is already carrying on a certain amount of dental studies but not sufficient to comply with what you think should be done in that direction. So that that legislation, I agree with you, should be made a part of the national legislation as a means of providing better dental health for the American people.

But in addition to that, do you not think that something should be done to provide for the dental care for the people when they grow older and when the dental diseases do become apparent, and they need care?

Dr. Flagstad: There are many programs to take care of the adults. We have many programs now. They should be extended, however. But they could also be taken care of under the grants-in-aid system.

The Chairman: Under a grants-in-aid system.

Dr. Flagstad: Yes.

The Chairman: Of course, it is very difficult to provide a system of care for teeth under a health insurance program. That is to say, it is not so susceptible to that method of protection as other diseases?

Dr. Flagstad: That is what we have been trying to point out in our statement, Senator. We pointed that out in the statement.

The Chairman: That is the position of your organization?

Dr. Flagstad: Yes.

The Chairman: That it should be done by

provisions which would provide methods of avoiding dental diseases rather than curing them?

Dr. Flagstad: Accent should be on that particular prevention, and research.

The Chairman: Accent should be on prevention instead of the cure. But do you think that there should be no effort whatever to provide dental care for the people of the country who are unable to pay for it? The poorer sections? I mean to say, in the lower income groups where there is a considerable burden on them. Do you not think there should be some way that the people should be enabled to secure some modern dental care?

Dr. Flagstad: Senator, may I have the privilege of calling on the secretary of the Council on Dental Health, who has made a thorough study of this particular subject, Dr. Allen Gruebbel of Chicago.

The Chairman: He will be here as a witness?

Dr. Flagstad: He is here now.

The Chairman: Will he appear separately as a witness?

Dr. Flagstad: No, he will not. He can just answer these questions.

The Chairman: He may answer that question.

Dr. Gruebbel: Senator Murray, Senator Donnell, I believe the basic difference between the proposals in Senate Bill 1606 and that proposed by the American Dental Association in S. 1099, is that the first would attempt to improve dental health through a national insurance system, while S. 1099 is based on the development or expansion of community health services.

The Chairman: Will your program propose to prevent dental disease rather than cure?

Dr. Gruebbel: In addition to prevention we also propose to provide dental services in so far as we are able to provide them on a community basis.

The Chairman: Oh, on a community basis.

Dr. Gruebbel: That is the purpose contained in Senate Bill 1099.

The Chairman: I beg pardon?

Dr. Gruebbel: It is primarily a grants-in-aid bill to provide dental services on an experimental basis on a community level. We believe that past experience shows that such programs, developed on a community basis and designed to meet the need in the community itself, can be very effective. We do not believe that there is any evidence to show that a compulsory health insurance system will do that, because the conditions in the various communities are so different. You cannot, in our estimation, have one blanket program on a national basis which will fit every community, because the circumstances and needs are so very different in the various communities.

The Chairman: The bill, 1099, you say provides that method of approach to this problem?

Dr. Gruebbel: That is right.

The Chairman: I will have that bill submitted for the record. We do not have a copy here at the present time. I will see that one is filed for the record.

(Senate Bill 1099 referred to is as follows:)

The Chairman: Now, of course, in our bill, this bill S. 1606, there was no effort here to provide any complete system of dental care.

It is provided in subdivision (b) of Section 210, on page 58:

"The Surgeon General, having regard for the adequacy of available personnel, may, after consultation with the Advisory Council and with the approval of the Administrator, determine for any calendar year or part thereof that general dental, special dental, or home-nursing benefit shall have such restricted content as the Surgeon General may determine."

In other words, it was recognized that there was a lack of sufficient personnel in the dental profession to provide any real, adequate system of dental care, and that it was proposed only to have a limited system until such time as adequate dental personnel became available.

You are familiar with those provisions?

Dr. Gruebbel: Yes, sir, I am.

The Chairman: Then you do not approve of that. You do not think any effort whatever should be made to provide for dental care under a bill of this kind, under a system of this kind?

Dr. Gruebbel: I do not believe it would be effective.

The Chairman: You think that the system which you propose and which is proposed in the bill S. 1099 is the adequate system of dental care?

Dr. Gruebbel: We believe 1099 will give

us an opportunity to experiment with different types of programs and that it will give the community and the state a voice in selecting a plan to meet local needs.

Dr. Flagstad: May we also point out, Senator, that the restricted content there actually promised is of very little value unless the patient follows it up with care for which they must pay the expenses themselves.

The Chairman: I am in full sympathy, of course, as I have indicated by my advocacy of the dental research legislation. I believe that a program of that kind, if carried out, would certainly provide for this country a very fine system, and that it would go a long ways toward solving the serious problems we have in this country on dental care and decay.

But I do believe that in addition to that, there should be some way in which people who are unable to pay for the very expensive dental care which becomes necessary, when their teeth become in a very bad state of decay; but you feel that they could be handled in a local way through the community service?

Dr. Gruebbel: Yes sir, through community services aided if necessary by grants-in-aid.

The Chairman: Under a grants-in-aid system.

Dr. Gruebbel: Yes, sir.

The Chairman: Any questions?

Senator Donnell: Dr. Gruebbel, you come from Missouri, do you not?

Dr. Gruebbel: Yes, sir, I do.

Senator Donnell: You served in the Department of Health under two administrations there?

Dr. Gruebbel: Yes, sir.

Senator Donnell: Dr. Flagstad, you are the chairman of the Committee on Legislation of the American Dental Association?

Dr. Flagstad: That is right.

Senator Donnell: Senator Murray read from a circular, a copy of which I hold in my hand, a statement of the principles of the House of Delegates of the American Dental Association.

I will ask you to state whether or not the American Dental Association has a Bureau of Public Relations.

Dr. Flagstad: Yes, they do.

Senator Donnell: And has that Bureau of Public Relations considered it to be advisable to issue and circulate a circular opposed to the enactment of S. 1606?

Dr. Flagstad: The "Blueprint for Dental Health" has been circulated to the dentists.

Senator Donnell: By the Bureau of Public Relations of the American Dental Association?

Dr. Flagstad: That is right.

Senator Donnell: And that is the paper which contains these principles from which Senator Murray read?

Dr. Flagstad: Yes.

Senator Donnell: There is a very concise statement of nine objections here to S. 1606, and with the consent of the Chairman, I ask that that particular "Blueprint for Dental Health" be incorporated in the record.

The Chairman: All right.

(The document referred to is as follows:)

Senator Donnell: I ask you also, Dr. Flagstad, whether or not there was prepared a statement on a national program for dental health by a joint committee of the Council on Dental Health, Committee on Legislation, and Committee on Economics of the American Dental Association?

Dr. Flagstad: There was, Senator.

Senator Donnell: Has that document been distributed by the Bureau of Public Relations?

Dr. Flagstad: It has, to the dental profession.

Senator Donnell: Referring particularly to the testimony of Dr. Gruebbel, I call your attention to one paragraph which I would like to have in the record, from pages 6 and 7 of that document.

"In keeping with the traditions that have made this country great, the program is based on the assumption of responsibility by all concerned; and the greatest responsibility is laid upon the American community. In this way, local funds and facilities, under local control can be made to serve the interest of dental health. For this reason, among others, the American Dental Association has not recognized a national compulsory health insurance system as effective or desirable in providing dental care; i.e., because such a system nullifies local responsibility and local control."

Addressing myself to Dr. Gruebbel, I take it that states very distinctly the thought which you set forth a few moments ago in your testimony?

Dr. Gruebbel: That is right, Senator.

Senator Donnell: I believe your testimony, Dr. Flagstad, indicates that the members of the American Dental Association, they are

more than two-thirds of the 75,000 dentists in the United States?

Dr. Flagstad: That is right, Senator.

Senator Donnell: The membership of that association being approximately 56,000. And that you have constituent societies comprising all of the forty-eight states; is that right?

Dr. Flagstad: That is right.

Senator Donnell: This House of Delegates plan has been in effect some years in your organization. That is, the plan of organization whereby a House of Delegates is set forth?

Dr. Flagstad: As long as I have been familiar with the association.

Senator Donnell: And that House of Delegates is chosen from the country somewhat similarly to the method by which the House of Delegates of the American Medical Association is chosen; is it not?

Dr. Flagstad: I presume it is along the same line. The House of Delegates of the American Dental Association is composed of representatives from each state. Each state has a representation in proportion to its dental population, and they are elected by the state association.

Senator Donnell: And you know, generally speaking, that the American Bar Association likewise has a House of Delegates plan of organization, does it not?

Dr. Flagstad: I am not familiar. I will ask our committee.

Senator Donnell: That is correct, Mr. Fox, is it not?

Mr. Fox: Yes.

Senator Donnell: What is your full name?

Mr. Fox: George H. Fox.

Senator Donnell: You are located in Chicago?

Mr. Fox: Yes, sir.

Senator Donnell: You are a lawyer?

Mr. Fox: Yes.

Senator Donnell: How many years have you practiced?

Mr. Fox: Eighteen years.

Senator Donnell: That is all.

The Chairman: Doctor, you have, of course, examined this bill?

Dr. Flagstad: Yes, we have examined it quite thoroughly.

The Chairman: And it undertakes to provide for many of the things that your association is in favor of. Do you not think it would be possible to have in this bill everything that you advocate as proper for the dental care of the people?

Dr. Flagstad: I rather imagine, Senator, that it is possible, yes, but it does not contain it now.

The Chairman: And it does not contain it now, but it would be possible for you to suggest to us amendments that would make this bill provide the care which would be essential, in your judgment, and which would be the better method of handling the problem?

Dr. Flagstad: I think it would be rather difficult, and I should like to call upon the editor of the American Dental Association Journal, Dr. Harold Hillenbrand, to answer that question.

Dr. Hillenbrand is here.

Dr. Hillenbrand: I would like to give the informal opinion, that so long as the bill contains a compulsory health insurance program with dental provisions, it would be extremely difficult to amend the bill in that regard.

There is some possibility that S. 190 and S.1099 might be placed in Title I, but that would involve technical considerations which I am not prepared to discuss fully here.

The Chairman: The bill provides in various sections scattered throughout the bill for local community participation, and it provides for study and recommendations on the full dental program by the Surgeon General. Of course, at the present time you recognize that we would not have the personnel available in this country to give complete dental care for the American people.

Dr. Hillenbrand: That is right.

The Chairman: But could not a study be made, and could not provision be made that would be a great step forward in bringing better dental health to the nation?

Dr. Hillenbrand: Yes. The American Dental Association has urged that a start be made almost at once. A start, however, which would conserve rather than disperse dental personnel.

A dental program such as mentioned in Title II would cause dispersion of dental personnel rather than conservation of dental personnel. This is not true of the children's program.

The Chairman: You think, with the present state of the personnel in the profession, that it would be better to concentrate on the provisions with reference to the care of children?

Dr. Hillenbrand: Yes.

The Chairman: And that if you attempted to put on a full program, it would be a dispersion that would not be very effective?

Dr. Hillenbrand: Yes.

The Chairman: And that is because of the insufficient personnel in the country?

Dr. Hillenbrand: Yes. Cruel as it may sound, it is not possible for all adults to get all the dental care they need at the present time. We feel that to face this situation in the best interests of the country, dental personnel should be devoted mainly to children and to the prevention and control of dental diseases.

The Chairman: In other words, there is a great segment of the American population whose mouths have gotten in such shape that it would not be practical to attempt to cure them because of the tremendous task that would be implied in such an undertaking?

Dr. Hillenbrand: Yes. And that involves two factors.

One is the factor of personnel, and the other is the factor of cost, which would be extensive for many millions of people.

The Chairman: It would be better to let that go and start now and build up from the children that are with us at the present time to a better dental care system in the United States?

Dr. Hillenbrand: Yes. Many people have been neglecting their teeth for generations. We feel that rather than undertake an impossible task for such adults, we should undertake the more possible program of preventing and controlling dental diseases in children.

The Chairman: I have had many consultations with you, Doctor, and with the other members of your profession, and I want to say they have always been very satisfactory and very helpful, and I have gained a lot of advice and benefit from my associations with you; and I am sure that you will continue to assist us in working out this problem of national health.

Dr. Flagstad: We will be glad to do so. Thank you.

Senator Donnell: Dr. Hillenbrand, do you favor following of a plan of national compulsory health insurance in the administration of dentistry throughout the country?

Dr. Hillenbrand: No, I do not.

Senator Donnell: Thank you.

The Chairman: Thank you, Doctor.

Dr. Flagstad: Thank you. We are very grateful, Senator Murray, the dental profession.

THE JOURNAL *of the*
AMERICAN DENTAL ASSOCIATION

Harold Hillenbrand, D.D.S., Editor
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Published by the American Dental Association
222 East Superior St., Chicago 11, Ill.

JUNE 1, 1946 • EDITORIALS • VOLUME 33

DENTAL OFFICERS PAY AGAIN

On May 1 the War Department announced new criteria governing the release of medical officers who can now be separated under an "adjusted service rating" of sixty points or *thirty* months of active service or on reaching the age of 45. Dental officers were excluded from the benefits of this directive and to qualify for separation must still have sixty points or *thirty-nine* months of active service or must have reached the age of 45. This open discrimination against dental officers was immediately and vigorously questioned by the American Dental Association, through the War Service and Postwar Planning Committee, and the following statement was elicited from Maj. Gen. Norman T. Kirk, Army Surgeon General.

In reply to your letter of May 3, you are advised that failure to reduce the number of months' service required of Dental Corps officers, in keeping with the reduction for officers of the Medical Corps (39 to 30), is due to the fact that practically no additional dental officers have been commissioned and brought to active duty in the past ten months.

Upon the cessation of hostilities, and the initiation of the demobilization phase, the Army had two missions in the dental field—to provide adequate dental care for its personnel, and to demobilize its dentists as rapidly as military requirements would permit. Such is still the aim of the Medical Department. However, no reduction in the number of months served (39) required of an officer of the Dental Corps to be eligible for return to inactive status can be justified until additional officers are obtained. With that end in view, the War Department authorized the procurement objective whereby commissions are available to 750 qualified dentists, but, up to the present, the response to the appeal to young dentists to apply for appointment has been practically nil. Therefore, until some means have been found whereby additional dental officers can be secured, the period of service required of those already in the Army cannot be reduced. This condition, it is hoped, will be alleviated in the near future and necessary steps to that end have already been initiated.

This explanation glibly makes the point that dentists have failed to fill the recent quota but it does not go into the reasons for that situation. In its failure to get dental officers in recent months, the Army is reaping its harvest of continued maladministration of personnel problems in the Dental Corps, of chronic bungling in the dental training program and of a shortsightedness in planning its dental personnel program

that would be extraordinarily remarkable any place outside of the Army. As a matter of plain speaking, dental officers, by being forced to adhere to high separation standards which are being lowered for others, are being asked to pay for these Army bad guesses and mistakes.

When war came, the Army opened and closed commissions in the Dental Corps with such eccentric rapidity that dentists and state procurement and assignment chairmen were in a perpetual quandary. On one day a large procurement quota would be set and on another the Dental Corps would be closed and dentists in the process of getting commissions, having closed their offices, would be sent back to civilian life. The Army Specialized Training Program (ASTP) was initiated with the proper flourish of military trumpets as the answer to the problem of providing the Army with a continuing supply of dental personnel. This program was barely in full motion when one entire class of dental graduates was sent into civilian life because "procurement objectives" allegedly had been reached. These young dentists, ready for service and trained at government expense, were, so far as the Army was then concerned, not needed for present or future duty. Selective Service, however, thought otherwise. Many of these ASTP graduates were sent into other branches of military service after being trained by and for the Army; others were made to run the risk of being inducted as privates by their draft boards merely because the Army thought it did not need dentists. Under this mistaken knowledge of its own needs, the Army eventually shut down the entire dental ASTP and permitted many potential dental officers to return to civil life instead of completing their training as replacements for veteran officers. So certain was the Army that the matter of dental personnel was well in hand that, at about this time, the Dental Corps was again closed.

By the time the war ended the Army had masterfully closed all doors to new dental personnel. Then came the call for 750 dentists in a new procurement objective. There should be no speculation why this quota remains unmet, since the Army for months had been at particular pains to make ineffective every mechanism by which it might procure young dental officers.

In medicine, according to a recent estimate,[1] 4,500 medical officers now in the Army were trained under the ASTP, 5,000 more will be eligible in the next five months and after that a final total of 3,900 will become available. Thus, 13,400 medical officers were trained under the ASTP to become replacements for the older men who had already seen considerable active duty. Only the indecision and lack of foresight of the Army officials who designed the dental program prevented a similar program of consistent dental recruitment. If such a program had been carried out, older officers could now be released and there would be no need for new procurement objectives to be met voluntarily.

There are other factors, too, which should be added to the Surgeon General's simple little explanation. The Army, with its long record of discrimination against dental officers, its withholding of administrative authority from the Dental Corps, its assignment of dental officers to unprofessional tasks, its tardy promotions and its failure to recognize the task that was performed by the Dental Corps in spite of these handicaps, is finally having to pay the penalty for such mismanagement. Confidence in Army statements of Dental Corps procurement needs and in equitable treatment for Dental Corps officers was thoroughly destroyed by these methods. Nor was new

1. Fitts, Francis M.: Training in Medicine Under the Army Specialized Training Program. J.A.M.A. 131:63, May 4, 1946.

confidence built by the repeated reports from dental officers at home and abroad that their professional skills were being allowed to deteriorate owing to the lack of dental assignments and the excess of dental personnel. In several instances, pools of unneeded dental officers were quickly reduced after the matter had been brought to official attention. There is good cause to wonder if similar overstaffing does not exist in many other places to which attention has not been officially drawn. There can also be serious doubt that the Army even knows what its present needs and resources in dental personnel are.

The new directive climaxes a situation which almost every dental officer has recognized throughout the war: the Dental Corps either does not have qualified personnel to manage its own program or the qualified officers of the Dental Corps suffer from interference and insufficient authority in managing it. There is a good deal of evidence that the latter is true. If so, it is high time that the officers of the Dental Corps thus handicapped recognize their predicament and seek an adequate remedy. If this remedy is not to be found in changing the present regulations—and almost everyone is convinced that it is not—legislation must be introduced and vigorously supported by those who now suffer because it is lacking. Dentistry cannot continue to put up with this interference in its efforts to provide dental care more efficiently under its own program. There is every reason to believe that Congress will concur in this decision and will provide effective machinery through new legislation for carrying out this essential task.

HEREDITY AND DENTAL CARIES

There is a considerable body of dental literature dealing with heredity as a basic influence in the susceptibility or resistance to dental caries. The larger part of this consists of opinions that seem to favor the view that there is some relation between the two, but there is little agreement on the identity or interplay of the factors involved. Korkhaus,[1] among others, however, believes that this relation has not been demonstrated because in his examination of identical and non-identical twins he did not find "an essential influence of hereditary factors in caries." Hunt and his fellow workers reported in 1944[2] that in rats hereditary factors do play a role in dental caries. In view of these conflicting viewpoints, it is likely that additional data on specific hereditary factors and on their mode of transmission are needed before a more definite evaluation of this interesting problem can be made. In this connection, too, the influence of environmental factors must be separately established and studied before anything more than opinions can be hazarded.

Klein, who is conducting an extensive study of the family and dental disease, has already shown[3] that brothers and sisters of highly susceptible children have twice as much caries experience as the brothers and sisters of caries resistant children. In a new study reported in this issue,[4] Klein presents evidence on the relation between the caries experience of parents and their offspring. The study was conducted on

1. Korkhaus, Gustav: Summary in: Dental Caries. Ed. 2. New York, 1941, p. 150.

2. Hunt, H. R.; Hoppert, C. A., and Edwin, W. G.: Inheritance of Susceptibility to Caries in Albino Rats. J. D. Res. 23:385, October 1944.

3. Klein, Henry, and Palmer, C. E.: Studies in Dental Caries: Familial Resemblance in Caries Experience of Siblings. Pub. Health Rep. 53:1353, August 5, 1938.

4. See page 735 of this issue.

5,400 persons in 1,150 families. The fathers in this group were examined for caries experience (DMF) and placed in one of three groups indicating high, medium or low caries experience. A similar procedure was followed for the mothers. This classification provided Klein with the opportunity to study nine different types of matings: high DMF mother and high DMF father, low DMF mother and low DMF father and the other possible combinations. The children of these matings were then examined for caries experience and a consistent relation between the caries experience of parents and the caries experience of children was noted. The findings on daughters 15-19 years old are illustrative. In cases where mothers with low DMF rates married fathers with low DMF rates, the number of DMF teeth fell to 4.8. In cases where mothers with high DMF rates married fathers with high DMF rates, the number of DMF teeth in the offspring rose to 10.5. This rather definite relation held quite consistently in the other combinations of matings that were possible.

From this, Klein concludes that "dental disease susceptibility in children involves strong familial vectors which very likely have a genetic basis, perhaps sex-linked." Additional data are available for this group and an attempt will be made in later studies to identify the genetic mechanisms that are involved.

FEDERAL GOVERNMENT CONSOLIDATES HEALTH AGENCIES

President Truman, acting under a reorganization law passed by Congress last year, has merged all of the federal government's health and welfare agencies under the Federal Security Agency, now headed by Watson B. Miller as administrator. The executive order was issued May 16 and will automatically take effect in sixty days unless Congress vetoes all or part of it. The President also stated that he soon will ask Congress to make this agency a regular department with its secretary a member of the Cabinet.

Reorganization under the new order is sweeping. The Social Security Board has been abolished and its functions will be assumed by the Federal Security Agency. The Children's Bureau, a health agency which has been in the Department of Labor since 1913, is now grouped with other federal health agencies. The Bureau of the Census is transferred from the Department of Commerce to the new agency. In addition to the transferred groups, the Federal Security Agency already includes the U. S. Public Health Service, the Office of Education, the Food and Drug Administration and various rehabilitation services.

The merger, advocated by organized dentistry and medicine for many years, is a constructive step by the federal government which has long sought a coordinated program for national health while paradoxically retaining its own widely-scattered health and welfare agencies. Under proper direction and with representation in the President's Cabinet, the new agency will be in a position to make constructive and acceptable suggestions for a sound national health program.

NEWS OF DENTISTRY

National Committee of Dentists Not Officially Connected with A.D.A.

Inquiries from many members of the American Dental Association have been received at the Central Office in Chicago regarding the newly-formed "National Committee of Dentists Cooperating with the National Physicians Committee for the Extension of Medical Service."

This committee has solicited funds from members of the American Dental Association to oppose the enactment of the Wagner-Murray-Dingell bill. The statement of the committee indicated that it hopes to collect $75,000 from dentists for this purpose.

In response to these inquiries, Harry B. Pinney, General Secretary of the American Dental Association, issued the following statement:

The Central Office has received inquiries in connection with requests to members to give financial assistance to support the legislative program conducted by the "National Committee of Dentists Cooperating with the National Physicians Committee for the Extension of Medical Service."

This new committee is an independent group not officially supported, directly or indirectly, by the American Dental Association. The Board of Trustees, acting on a similar proposal from the National Physicians Committee for the Extension of Medical Service in 1940, agreed that the resources of the American Dental Association were sufficient for present legislative purposes.

For many years, it has been the policy of the Association not to solicit or use financial support of any outside agency in the furtherance of its legislative program. It has also been the policy of the Association to provide all needed resources to its committees for the proper prosecution of a desirable legislative program. No new circumstances have arisen under which a change of these fixed policies is indicated.

Contributions to the National Committee of Dentists should be made only after the individual has satisfied himself personally as to the merits of the projects in which the committee and its cooperating body are engaged.

McAllister, Columbus Hotels Headquarters for Miami Meeting

The McAllister and Columbus Hotels have been named co-headquarters for the House of Delegates meeting to be held in Miami October 14, 15 and 16, Harry B. Pinney, General Secretary, has announced. These hotels are adjacent and are connected by an arcade.

The Everglades Hotel, a short two blocks from the headquarters hotels, has also reserved a substantial number of rooms for convention delegates. All three hotels are on Biscayne Blvd. and face the park and bay. It is suggested that delegates and others planning to attend the meeting send their requests for reservations direct to the hotel of their choice.

McAllister, 10 Biscayne Blvd.: singles, from $4; doubles and twins, from $7.

Columbus, 50 Biscayne Blvd.: singles, from $4; doubles and twins, from $8.

Everglades, 236 Biscayne Blvd.: singles, from $3; doubles and twins, from $5.

University of Kansas City to Offer Postgraduate Dental Course June 17

A six-week postgraduate course in dental prosthesis will be offered at the School of Dentistry, University of Kansas City, beginning June 17.

Complete and partial dentures and various types of crown and bridge restoration will be covered. Classwork will consist of lectures, demonstrations and supervised clinical work, with each student assigned actual clinical material.

Senate Labor Group Approves $2,000,000 Dental Research Bill

The Senate Labor Committee last month approved a bill calling for a $2,000,000 national institute of dental research. The bill, S. 190, is sponsored by the American Dental Association.

Unscientific Statements Laid to Dental Literature; Research Urged

Dental literature contains many conflicting and often unscientific statements about the effects of brushing, massage and chewing of resistant or resilient substances upon the gingivae, periodontal membrane, alveolar bone and oral mucosa, in the opinion of a group consisting of periodontists, research workers, an oral surgeon and an orthodontist.

At a conference held April 4 in the Central Office of the American Dental Association, the group urged that further research be conducted to prevent spread of such statements, which, it charged, are based on personal opinion rather than on scientific fact.

As a guide in preparing and evaluating dental health information for the public, the conference framed a six-point recommendation for submission to the Association's Council on Dental Therapeutics, Council on Dental Health and Bureau of Public Relations.

The recommendation reads:

(1) On the basis of present evidence, it is our opinion that the gingivae are not beneficially influenced by the direct mechanical action of mastication.

(2) In the light of current available information, it is our opinion that the periodontal membrane and alveolar bone may be beneficially stimulated only through normal functional influences, and that there are no data available to indicate that added chewing exercises, massage or medicaments applied to the surfaces of the gingivae or alveolar mucosa are beneficial to the periodontal membrane and alveolar bone.

(3) Present evidence does not support the recommendation of the use of specific dietary items or other substances that promote chewing in addition to that required by the well-balanced diet.

(4) It is our opinion, in light of available evidence, that there is nothing to indicate that massage (beyond that which is involved in the proper use of the toothbrush), dentifrices and mouthwashes (except for their detergent value), or medicaments applied routinely and indiscriminately by the public to the oral mucosa are beneficial to this structure.

(5) It is our opinion, in light of available evidence, that the effects of toothbrushing vary with the physical and structural characteristics of the brush, the technic of its use and the condition of the mouth in which the brushing and the technic are applied.

(6) It is our opinion that, in light of current scientific evidence, there is no justification for broad efforts to strengthen the bite of the general public.

The meeting was called at the request of Donald A. Wallace, secretary, Council on Dental Therapeutics; Allen O. Gruebbel, secretary, Council on Dental Health; and Lon W. Morrey, director, Bureau of Public Relations.

Others in attendance were: Harry Lyons, professor of oral pathology and therapeutics and periodontia, School of Dentistry, Medical College of Virginia; Kenneth A. Easlick, associate professor of dentistry, School of Dentistry, University of Michigan; Isaac Schour, professor of histology and head of the department of histology, College of Dentistry, University of Illinois; Maynard K. Hine, dean and professor of periodontia and histopathology, School of Dentistry, Indiana University; Alton W. Moore, instructor, College of Dentistry, University of Illinois; Daniel F. Lynch, secretary, Research Commission, American Dental Association; H. Berton McCauley, division of physiology, National Institute of Health, U. S. Public Health Service; and F. D. Ostrander, associate professor of dentistry in charge of materia medica and therapeutics, School of Dentistry, University of Michigan.

Plans are being made to call meetings of a similar character in the future as conditions warrant.

University of Pennsylvania to Offer Postgraduate Course in Anesthesia

The University of Pennsylvania will offer a one-week postgraduate course in anesthesia and dental and oral surgery, beginning June 3 in the Thomas W. Evans Museum and Dental Institute School of Dentistry. The course, to be conducted by John H. Gunter, D.D.S., M.D., will cover all phases of dental surgery, including exodontia as employed in routine surgical and operative practice.

Among the subjects to be discussed are diagnosis, x-ray interpretation, preoperative and postoperative management of surgical cases, gingivectomy, alveolectomy, root resection, surgery associated with immediate denture insertion, oral tumors, surgical infections involving teeth and jaw bones and the technic of tooth removal, including impactions and antral involvement. Enrollment is limited to twelve.

Introduce Legislation Proposing State-Administered Medical Relief

A bill calling for annual expenditures of $220,000,000 in federal funds for state-administered free medical service was introduced into Congress last month by Senators Robert A. Taft, Ohio; Joseph H. Ball, Minnesota; and H. Alexander Smith, New Jersey.

Intended to replace the Wagner-Murray-Dingell compulsory health insurance bill, the new measure proposes that, as a condition of obtaining federal aid, each state shall make a survey of health activities, Senator Taft explained. "Based on this," he said, "the state must propose a plan by which hospital and medical service will be available to all individuals unable to pay for such services.

"The bill further provides that a state may encourage the formation of voluntary health insurance funds by paying to such funds the premiums required for low income individuals unable to pay for insurance themselves.

"The bill also requires the state to provide periodical medical and dental examinations of all children in public and private, primary and secondary schools."

Introduction of the measure came a month after Senator Taft branded the Wagner-Murray-Dingell bill "a socialistic monstrosity." Under the administration proposal, he charged, "a federal bureau could tell everyone when he could have a doctor, how often the doctor could call and whether the patient could have a specialist."

The compulsory insurance bill has met continued opposition from the American Dental Association.

President Signs Measure Giving Veterans Top Priority on Surplus

Veterans last month moved up on priority lists for purchase of surplus goods, as President Truman signed legislation giving dischargees first choice on certain designated items and second choice on all others.

The bill, S. 1757, long championed by the War Service and Postwar Planning Committee of the American Dental Association, gives veterans exclusive rights to the purchase of certain items, including dental apparatus and equipment, and raises veterans to a No. 2 general priority rating—just below federal agencies. Formerly veterans ranked below state and local governments and small business corporations.

In signing the bill, however, the President warned that items set aside for exclusive sale to veterans are only those

in heaviest demand and are not available in surplus in sufficient quantities to satisfy more than a small proportion of prospective veteran purchasers who have applied for them.

Among set-aside items are medical, surgical and dental apparatus and equipment, including major operating tables, operating lamps, field x-ray units, diathermy machines, dental units, dental chairs and dental cabinets.

Graduate Educational Program Planned for Dental Corps Officers

A program of professional graduate education for Dental Corps officers has been initiated by the Dental Consultants Division, Office of the Surgeon General, with future plans to authorize such a program in an army regulation, according to a recent announcement.

Plans include the organization of special postgraduate courses at large permanent army hospitals, medical department service schools and civilian teaching institutions. The program will be supervised by the Surgeon General, who will prescribe general policies.

Cleveland Dentist Named to Direct Veterans Administration Assignments

Ernest J. Fedor, Cleveland, chief of the inpatient operations division of the Veterans Administration dental services, has been named to direct the assignment of Veterans Administration dentists to hospital dental clinics.

He also will make recommendations on new dental services, supplies, diagnostic procedures, treatment and standards for clinics to be constructed or altered.

Temple University Dental School Alumni Society to Meet June 7

The Dental Alumni Society of the School of Dentistry, Temple University, will hold an all-day meeting June 7, featuring essayists, clinicians, a luncheon and a good-fellowship dinner. A report on the Temple dental school of the immediate future will be given by Gerald D. Timmons, dean.

Reservations can be made by writing Gustav C. Tassman, general chairman, Medical Arts Building, Philadelphia 2.

Glenn H. Whitson Named to Head New York Society of Orthodontists

Glenn H. Whitson was elected president of the New York Society of Orthodontists at its annual meeting March 4 and 5 in New York City.

Other officers elected at the meeting were: John W. Ross, president-elect; Oscar Carrabine, vice-president; J. A. Salzmann, editor; John W. Ross, director; Clifford G. Glaser, alternate; and Oscar Jacobson, secretary-treasurer.

Named to the board of censors were: E. Stanley Butler, chairman; William C. Keller; and Raymond L. Webster. Executive committee members are Richard Lowy, chairman; George S. Callaway; and Donald B. Waugh. Glenn F. Young was named chairman, and Robert H. W. Strang and Gerald Franklin, members of the advisory committee.

The next meeting of the society will be held at the Waldorf-Astoria Hotel, New York City, November 4 and 5.

Court of Appeals Rules Fee Split Is Unprofessional Conduct

The Court of Appeals of the State of New York ruled recently that taking a layman into partnership in professional work and dividing fees with him on a percentage basis constitutes unprofessional conduct for a licensed professional man.

The decision was rendered in the case of William Bell, New York City dentist, whose license to practice was suspended for a year by the State Board of Regents on the basis of findings of the state board of dental examiners.

Left to right: Dean Roy J. Rinehart, School of Dentistry, University of Kansas City; Carl O. Flagstad, secretary, American Association of Dental Schools; and Dean Robert W. McNulty, new member of the Council on Dental Education, American Dental Association, at the meeting of the American Association of Dental Schools March 18 in Kansas City. Dean Rinehart later was honored at a dinner concluding the two-day session.

Veterans Administration Reports Increase in Dental Cases in 1945

The Veterans Administration furnished dental care to more beneficiaries last year than in 1944, according to the Annual Report of the Administration of Veterans' Affairs for the fiscal year ended June 30, 1945.

"During this year," the report states, "dental care was provided for 35,111 hospital patients, 4,725 domiciliary members and 6,371 outpatients in clinics maintained by the Veterans Administration. Of these 46,207 beneficiaries, 16,945 were veterans of World War II and 29,262, veterans of World War I and other wars.

"These beneficiaries were furnished treatment at an actual cost of $1,323,796, as compared with the treatment of 41,581 beneficiaries at a cost of $1,222,280 for the preceding year.

"Had these services been procured through the medium of private practitioners, the estimated cost would have been $1,992,853. Thus, a saving of $669,057 was effected by the operation of dental clinics by this administration. The cost per case of furnishing this treatment was $28.65, as compared with $29.40 for the preceding year.

"Dental services ordinarily are rendered in clinics maintained by this administration. There are occasions, however, when it is more economical or expedient to refer the veteran to a designated dentist or a private practitioner

to have services rendered on a fee basis. During this year 2,354 beneficiaries were so referred at fees amounting to $112,245, as compared with 1,088 beneficiaries at fees amounting to $57,163 during the preceding year.

"The volume of artificial denture work has shown an increase over that for 1944. There were 30,402 new dentures constructed and 5,429 repaired during this year, as compared with 29,708 new dentures and 5,341 repairs during 1944, and 30,669 and 6,665 respectively in 1943.

"The number for this year includes 6,441 dentures constructed for 3,372 patients, who were rehospitalized to complete dental service started, but not completed, during previous episodes of hospitalization. This represents an increase of nine over the number of such cases for the preceding year.

"On June 30, 1945, there were 207 full-time dentists on duty with this administration, of whom 152 were commissioned officers of the army or navy."

Announce Rules for Research Grants from Public Health Service

The following memorandum outlining application procedures for research grants to private individuals and agencies has been issued by the U. S. Public Health Service:

Applications.—1. All applicants for grants-in-aid for research may secure application forms, "Application for Grant for Research Project," from the National Institute of Health.

2. An application made in the name of a university should be signed by an official of the university, such as dean or president, rather than by the director of the project.

3. When recommended by the National Advisory Health Council a research grant may compensate an institution (a) for the loss of teaching time which results directly from participation of any of the teaching staff in a research project and (b) for working space, utilities, supplies, janitorial service, etc.

4. U. S. Public Health Service Research Grants differ from Contracts of the Office of Scientific Research and Development in that (a) the funds of a grant are customarily paid in full at the start of a research project while an OSRD Research Contract operates on a reimbursable basis; and (b) any equipment purchased with grants-in-aid funds belongs to the grantee institution and not to the United States government. This eliminates the need for accounting for any property to the U. S. Public Health Service at the conclusion of any grant.

5. There are no requirements or regulations demanding matching of research grant funds by institutional or other funds.

6. Since mutual agreement is the basis of research grants, it is only with mutual consent that a research project may be concluded prior to or extended beyond the grant period originally determined, or may be speeded up, contracted or expanded during the term of the grant.

7. The grantee shall have full responsibility for the conduct of the project for which the grant is given except that: (1) semi-annual financial reports shall be requested; (2) accounts shall be kept separately, either on different ledgers or different parts of a ledger, and with copies of substantiating invoices or payrolls so that a Public Health Service auditor may readily ascertain true status of the accounts, and . . . (3) progress reports shall be requested approximately once a year unless the nature of the project is such as to make more frequent reports necessary.

8. It is requested that all manuscripts for publication carry the customary acknowledgment of grant assistance, and that twenty-five reprints of all papers published as a result of research grants be furnished the U. S. Public Health Service.

9. Even though grants of funds will be made on a yearly basis, duration of the investigation proposed will be an important consideration of the National Advisory Health Council, in its decision regarding recommendation for action. It is therefore requested that careful thought be given to question four of the "Application for Grant for Research Project" where an estimate of duration is asked for. Approval of the project would signify the grant of funds for one year and an indication to the grantee of favorable action

for continuation of the project so long as progress reports justify and Congress appropriates necessary funds.

Pittsburgh Dental Alumni to Mark School's 50th Anniversary June 11

The Dental Alumni Association of the University of Pittsburgh, School of Dentistry, will hold a victory reunion June 11 in joint celebration of the return of World War II veterans and the fiftieth anniversary of the dental school.

Among features of the all-day program will be the association's annual business meeting and election of officers, motion picture clinics, open house and reunion luncheons.

Truman Merges Welfare Units Under FSA; Seeks Cabinet Status

In a sweeping reorganizational move, President Truman last month merged the government's far-flung welfare activities under one bureau, for which he announced he will seek regular Cabinet status.

Acting under a reorganization law passed at his request a year ago, the President on May 16 transferred certain functions of the Children's and Census Bureaus and the Employee Compensation Commission to the Federal Security Agency, which, he asserted, already has more employees and spends more money than "several" of the ten regular departments.

"The importance of its functions," he added, "clearly calls for departmental status and a permanent place in the President's Cabinet." The agency at present is headed by Watson B. Miller as administrator and is concerned chiefly with social security.

Under the merger order, which will take effect automatically in mid-July, barring Congressional veto, the Children's Bureau and those of its functions concerning child welfare, crippled children, maternal health and child research, would be among transferrees to the FSA. Matters dealing with child labor under the Fair Labor Standards Act would be shifted to the wage and hour division of the labor department, which administers the rest of the act.

The order abolishes the three-member Social Security Board headed by Arthur J. Altmeyer, chairman, and places its functions directly under the FSA administrator.

The FSA was created in 1939 by the late President Roosevelt to coordinate the Social Security Board, the U. S. Employment Service, the Office of Education, U. S. Public Health Service, Food and Drug Administration, National Youth Administration and Civilian Conservation Corps.

Dental Specialists to Conduct Refresher Courses in Amsterdam

In an effort to restore Holland's dental practice to its pre-war level, a specialists' unit organized by the Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, will conduct postgraduate refresher courses in Amsterdam beginning July 15.

Attending will be 200 Dutch dentists and 100 dentists from other European countries, all of whom were prevented by the war from acquainting themselves with latest developments in dentistry. Instruction will be in the fields of roentgenology, denture service, oral medicine and diagnosis.

The unit, to be known as the "Ivory Cross Expedition" after a Netherlands association for elimination of tooth decay, will be headed by Lester W. Burket, professor of oral medicine at the University of Pennsylvania.

Other members are LeRoy M. Ennis, professor of roentgenology; John Burkhardt, Jr., professor of operative dentistry; E. H. Smith, professor of pros-

thetic dentistry; and Vincent R. Trapozzano, clinical professor of prosthetic dentistry, all of the University of Pennsylvania faculty; Edward C. Dobbs, associate professor of pharmacology, Baltimore College of Dental Surgery, University of Maryland; and two practicing dentists, Earl W. Knapp, graduate of the College of Dentistry, State University of Iowa, and former professor in the College of Dentistry, New York University, and Ferdinand G. Neurohr, alumnus of the School of Dentistry of the University of Pennsylvania.

Formation of the unit originally was suggested by Herbert Loeb, of Cambridge, Mass., a former president of the Netherlands Dental Society, who early stressed the need for a postwar training program to combat adverse effects of the Nazi regime on the study of dentistry in Holland.

Commissioned by the Netherlands government to further the project, Dr. Loeb was assisted by Dr. Burket, who was assigned to the undertaking by J. L. T. Appleton, dean of the School of Dentistry of the University of Pennsylvania.

Kansas Editorial Strongly Supports Legislative Program of the A.D.A.

The Bureau of Public Relations reports that the national legislative program of the American Dental Association was strongly supported in an editorial published March 13 in the *Kansas City Kansan*. The editorial, entitled "Dentists Oppose Socialization," reads as follows:

> In opposing the socialized medicine plan as offered in the Wagner-Murray-Dingell bill now before Congress, the American Dental Association has its own answer to the problems which those backing socialized medicine are attempting to answer. This is in the form of two bills sponsored in the senate by the dental association.
>
> The dentists, like the physicians, who would be more affected by the Wagner-Murray-Dingell bill, agree that there is a need for the spreading of greater medical and dental benefits to those now lacking proper attention. Their stand is that the standards of the entire profession would be lowered by the incursion of government into the application of their highly scientific and technical professions. They do not believe the bill would accomplish what it sets out to do without causing a great deal of harm. They contend that other methods short of governmental regimentation would better accomplish the ends desired.
>
> The dentists believe the two bills they sponsor will get the job done. One of these bills would provide for government financing and promotion of a research program to discover the causes and treatments of dental diseases. The other provides for federal grants to states which would establish programs of dental health education and dental care, particularly among children.
>
> The program set forth by the dental association further cuts the ground out from under proponents of a gigantic nationwide program of socialized medicine and dentistry. Judging from the past record of Washington bureaucracy, such a bill could not help but wind up with the members of these vital professions involved in administrative red tape and straight jacketed by regulations that would harm, not help, the cause of greater health on the part of the people.

Fellowships Offered for Graduate Dentists by Columbia

The School of Dental and Oral Surgery, Columbia University, announces the establishment of a limited number of fellowships for graduates of dental schools. These fellowships will offer opportunity for study in the following basic science departments of the university: anatomy, bacteriology, biochemistry, pathology, pharmacology, physiology.

For further information regarding qualifications and stipend, address the Dean of the Faculty of Medicine, Columbia University, 630 West One Hundred and Sixty-Eighth St., New York City.

Peruvian Orthodontics Professor Tours U. S. Dental Clinics, Schools

José Santos Herrera, professor of orthodontics in the School of Medicine, University of San Marcos, Lima, Peru, is on a three-month tour of dental clinics and schools in nine cities in the United States at the invitation of the U. S. Department of State.

Dr. Herrera will confer with colleagues, observe recent developments in the field of child dental health and visit clinics and dental schools with special emphasis on orthodontics. His itinerary includes Washington, Baltimore, Philadelphia, New York, Boston, Ann Arbor, Chicago, San Francisco and Los Angeles.

Committee Announces Procedure in Applying for A.D.A. Secretary Post

The special committee of the Board of Trustees of the American Dental Association appointed recently to receive applications for the position of General Secretary has issued the following statement through its chairman, LeRoy M. Ennis:

The constitution of the American Dental Association requires that the Board of Trustees nominate to the House of Delegates an applicant for the position of Secretary of the American Dental Association. As the General Secretary of the American Dental Association will not be a candidate for the office at his own request, the Board of Trustees has appointed the undersigned committee to receive applications and suggestions. The qualifications, experience and name of a candidate should be sent in quadruplicate to the chairman of the committee, LeRoy M. Ennis, 4001 Spruce St., Philadelphia 4.

Further information regarding the position of General Secretary may be obtained from any member of the committee: Howard E. Summers, First National Bank Bldg., Huntington, W. Va.; Henry Hicks, 5 Glen Court, Greenwich, Conn.; Russell A. Sand, 807 North Broadway, Fargo, N. Dak.; LeRoy M. Ennis, 4001 Spruce St., Philadelphia 4.

Retiring Chapter Counselor Feted by Dental Fraternity

The Duquesne Alumni and Nu Chapters of Psi Omega, national dental fraternity, honored William F. Swanson, recently retired deputy counselor of Nu Chapter, at a testimonial dinner April 3 at the University Club, Pittsburgh.

A.D.A. Bills Win Approval of Alabama Dentists at Annual Meeting

Members of the Alabama Dental Association voted unanimous approval of the American Dental Association dental health bills at the group's annual meeting in Birmingham April 9-11.

The association also voted to go on record as favoring the establishment of a "Grade A" dental college in connection with the new University of Alabama Medical College, now under construction in Birmingham. The group will request dentists throughout the state to urge their senators and representatives to approve appropriation of funds for building and maintenance. The establishment of the dental school was approved by the state legislature, but no funds have been voted for it.

The following officers were elected: M. L. Llewellyn, president; Pryor A. Williams, president-elect; Angus M. Sellers, vice-president; and George W. Matthews, secretary-treasurer.

Release of Metals to Japanese Authorized by Allied Headquarters

Allied headquarters in Tokyo recently authorized release to Japanese dentists of 170 kilograms of gold, 600 kilograms of silver and 10 kilograms of platinum a month, for three months. This is the first large amount of dental filling material available to Japanese dentists since early in the war.

REPORTS OF COUNCILS AND COMMITTEES

INTERNATIONAL RELATIONS COMMITTEE

REPORT ON MISSION TO WESTERN EUROPE TO RENEW PROFESSIONAL RELATIONS WITH DENTISTS OF WAR-RIDDEN COUNTRIES

In August and September of 1945, as an official representative of the International Relations Committee of the American Dental Association, I visited the countries of Western Europe to learn what cooperation we could expect from the dentists of the liberated countries in renewing scientific and fraternal ties after five years of war.

I went first to Paris and proceeded to get in touch with the leaders of the dental profession who are active in the present reorganization. The dental profession in France is now under the leadership of the *Conseil National des Dentistes de France,* made up of members of the French Resistance. The *Conseil* supersedes all of the organizations that were in existence before the war. The president, Jean Marandas, and the vice-president, Georges Moreau, at the head of the group working with the Minister of Public Health to reorganize the dental profession, were on their first vacation since the beginning of the war. Fortunately, I was able to see Amedée Sennac, secretary of the *Conseil.* He expressed the appreciation of the French dentists for my mission. I told him how interested our profession is in the welfare of our colleagues abroad and how much we should like to resume scientific ties with Europe. I mentioned our desire to send, at an opportune time, a group of American practitioners to Paris. Mr. Sennac has conveyed our intentions to the dentists of Paris and has also extended the offer of Dean J. L. T. Appleton, of the Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, to send complete files of dental journals to cover the entire period of World War II, when France was shut off from the rest of the world. Recently the committee has extended its efforts to collecting scientific dental books and journals from all of the universities and dentists of the United States to rebuild the files of five dental schools in France.

The main topic under discussion was the rebirth of the *Fédération Dentaire Internationale,* which brought together practitioners of many lands when it met every five years in a large city of Europe or of the United States. The French profession was always well represented in the *Fédération* and had a particularly outstanding meeting at the Grand Palais of Paris in 1931 under Prof. Georges Villain as president. After seeing Mr. Sennac, I met Dr. Charles F. L. Nord, The Hague, secretary of the *Fédération Dentaire Internationale*; Dr. A. Joachim, Jr., Brussels, representative for Belgium; and Dr. Philip Dear, of Lausanne, Switzerland. I also flew to London to see British members and to Switzerland to interview officers of the Swiss *Secours Dentaire International.* While in London, I had a conference with Drs. K. C. Campbell, G. H. Leatherman and M. H. G. Sturridge. It was decided that we would call a meeting of the *Fédération* in London and that at this meeting we would have a professional program and

election of officers under the chairmanship of the present secretary-general. We endeavored to arrange for the first postwar meeting of the *Fédération* to coincide with the meeting of the American Dental Society of Europe at the end of July of this year in London, when the clinicians and speakers of these two groups would find it easy to go to the Continent and be the guests of dental groups in Paris. The meeting was postponed by the London group because of shortages of food and lodging.

Before leaving the United States, I had contacted the French Medical Mission in Washington and had learned that the Minister of Public Health of France, François Billoux, wished to be informed of my activities. The Minister was very much interested in the program for reorganizing the *Fédération*. As an official representative of the International Relations Committee of the American Dental Association, I offered the Minister the use of the educational films owned by the Association. I also proposed to supervise the translation into French of the texts used with the films. Robert Prigent, the present successor to Mr. Billoux as Minister of Public Health, has been informed of these proceedings and will carry out the decisions that will be made.

A spontaneous example of international professional solidarity is the *Secours Dentaire International*, a project initiated in Switzerland with Prof. Dr. René Jaccard, of Geneva, as president. It has obtained the aid of a number of outstanding Swiss dentists, as well as of our Australian colleague, Dr. Philip Dear, of Lausanne. This organization has set itself the task of giving aid in the dental field to those persons in the liberated countries who are suffering from the effects of the war as well as to universities and dental institutions. It has created dental centers throughout France for the care of thousands of destitute children and adults.

In northern France, the only dental school that existed was part of the University of Lille, which was entirely destroyed. I am bringing this fact to the attention of the profession with the hope that some move will be made to rebuild the school. I feel certain that the dental manufacturers of the United States will be willing to cooperate and furnish the equipment needed after the school has been rebuilt. It seems fitting that the first step toward reestablishing a dental school which has been twice destroyed in a quarter of a century of wars be taken by the world's largest dental association. The best and latest improvements could be incorporated in this small token of sympathy to those of our profession who are so urgently in need of help.—*Edward J. Ortion, D.D.S., 1 East Fifty-Seventh Street, New York City.*

COMMITTEE ON LEGISLATION

STATUS OF THE AMERICAN DENTAL ASSOCIATION'S LEGISLATIVE BILLS S. 190 AND S. 1099

The American Dental Association has two bills in Congress which contain the proposals of the American Dental Association for improving the dental health of the people. These proposals are based upon the statement of principles adopted in 1944 by the House of Delegates to govern the establishment of dental health programs. This statement sets forth the Association's three-point program consisting of provisions for dental research, dental health education and dental care, especially for children.

The bill in the Senate to provide for

dental research is S. 190, and the bill in the Senate to provide grants-in-aid to the states for dental health education and for the prevention and treatment of dental diseases is S. 1099. Companion bills to these two bills were introduced into the House of Representatives at about the same time.

The first bill, S. 190, was introduced into the Senate on January 10, 1945, by James E. Murray, Montana. The main purposes of this bill are to establish the National Institute of Dental Research within the U. S. Public Health Service and to create a National Advisory Dental Research Council consisting of six members, appointed by the Surgeon General from leading dental or scientific authorities, at least four of whom must be dentists. The bill authorizes an appropriation up to $1,000,000 for the erection and equipment of a suitable building for the use of the Institute in carrying on research. The bill also authorizes an appropriation of $730,000 for each year, for maintenance expenses, including supplies and equipment, and also for the purpose of making grants-in-aid to universities, hospitals or other institutions, both public and private, or to individuals, for research projects relating to dental diseases and conditions.

The other bill, S. 1099, was introduced into the Senate on June 4, 1945, by George D. Aiken, Vermont, and by Claude Pepper, Florida. The purpose of this bill is to provide assistance to the states in developing and maintaining dental health programs, through grants-in-aid. It also authorizes grants-in-aid to states and political subdivisions, including municipalities, and to educational institutions and other non-profit agencies for approved studies, investigations and demonstrations in dental health care and education projects relating to the diagnosis, treatment and prevention of dental diseases. The bill would create a National Dental Health Council to review projects submitted to it or initiated by it for carrying out the purposes authorized in the bill, and to make recommendations to the Surgeon General. The Council is to consist of six members, appointed by the Surgeon General, the majority of whom must be leading dental authorities who are outstanding in the treatment, prevention and control of dental diseases. The bill authorizes an appropriation each year of whatever sum may be sufficient to carry out the purposes of the bill.

The bill authorizes the use of the funds for three purposes:

1. To assist the states and political subdivisions in establishing and maintaining adequate measures for the prevention, treatment and control of dental diseases, including dental care programs for children.

2. To provide grants to states and political subdivisions and to educational institutions and non-profit agencies for approved studies, investigations and demonstrations in dental health care and education projects relating to the diagnosis, treatment and prevention of dental diseases.

3. To conduct studies and collect information concerning studies relating to the treatment, prevention and control of dental diseases, and to make information concerning such studies or demonstrations available to public or private health agencies, the dental profession and the general public.

The allotments to the states are to be made on the basis of: (1) the population, (2) the financial need of the respective states and (3) such other factors as the Surgeon General may deem relevant to the accomplishment of the purposes of this bill.

Both bills were referred to the Senate Committee on Education and Labor, of which Senator Murray is chairman. This committee in turn referred the bills to a Subcommittee on Wartime Health and Education, of which Senator Pepper

is chairman. The subcommittee held extensive hearings on both bills in Washington on June 26, 27 and 28, 1945. Both bills were discussed at length in the hearings and there was no opposition to the principles or objectives of either bill, although several amendments were suggested in regard to minor details. A verbatim report of the testimony is published on page 743 of this issue.

At the conclusion of the hearings we had expected that the subcommittee would hold a meeting to consider the bills and give them a favorable report. However, shortly thereafter Senator Pepper, chairman of the subcommittee, made an extensive tour of Europe and did not return to the United States until a few months ago. In the absence of the chairman, it was impossible to secure consideration of the bills by the subcommittee.

In March 1946, at the request of the Committee on Legislation, the subcommittee returned the bills to the full committee which held a meeting to consider them. At this conference the Bureau of the Budget made a recommendation that the two bills be rewritten into one bill as an amendment to the Public Health Service Act in order to make it easier to codify the bills in the United States Code. At the suggestion of the Senate Committee on Education and Labor, the Committee on Legislation went into conference with the U. S. Public Health Service and the Social Security Agency and a single bill was drafted to comply with the recommendations made by the Bureau of the Budget.

A few major changes have been made in the new proposed bill as compared with the two bills as introduced. The National Advisory Dental Research Council in S. 190, and the National Dental Health Council in S. 1099, have been combined into one council to be known as the National Advisory Dental Health Council, to consist of six members appointed by the Surgeon General, to be selected from leading dental, medical or scientific authorities, and at least four of whom must be dentists. The Council is to be authorized to review research projects and programs; to collect information on studies in the field of dental health; to make such information available to health agencies, the dental profession and the general public; and to recommend grants to universities, hospitals, laboratories, public or private institutions and to individuals for research projects.

The proposed bill authorizes an appropriation of $30,000,000 a year for various public health services, though it is understood that $10,000,000 of this amount will be set aside as a budgetary item and earmarked for dental health purposes. This $10,000,000 will be allotted to the several states on the basis of (1) the population, (2) the extent of the dental health problem and (3) the financial need of the respective states. The proposed bill also contains authority to use up to $3,000,000 of the $30,000,000 appropriated to provide demonstrations and to train personnel for state and local health work. Of this sum there will be set aside as a budgetary item and earmarked for dental health purposes the sum of $1,000,000.

The proposed bill authorizes an appropriation of not to exceed $2,000,000 for the erection and equipment of a suitable and adequate building to be known as the National Institute of Dental Health as compared with an appropriation of not to exceed $1,000,000 in S. 190 for the same purpose. It was felt necessary to increase the building fund in order to meet the increased cost of construction that has occurred in the last few years.

The Committee on Legislation has sought the views and opinions of all government agencies which will be concerned with the provisions of the bills in order that the laws may meet with

general approval and in order that the dental health programs to be established may operate in the most efficient manner.

The Committee on Legislation has made every effort possible to speed these two bills out of the Committee on Education and Labor with a favorable recommendation. The philosophy for the improvement of the dental health of our people as contained in S. 190 and S. 1099 has been extremely well received by all groups in Washington.

There are three possibilities for the further prosecution of this legislation:

1. We have been informed on reliable authority that the Committee on Education and Labor may reconsider the two bills as originally written and may vote them out favorably.

2. The proposed bill as suggested by the Bureau of the Budget will probably be introduced.

3. There is still another possibility that the bills will be incorporated into new health legislation which is now in preparation.—*Carl O. Flagstad, Chairman; George H. Fox, Secretary.*

INCREASE IN VETERANS' PRIORITIES TO SURPLUS PROPERTY

A bill to increase the priority rights of veterans to surplus property became a law when it was signed on May 3 by President Truman. The new law will increase the rights of veterans in the following four ways:

1. The law authorizes the War Assets Administrator to set aside such quantities and types of surplus property as he may determine appropriate for exclusive disposal to veterans for their own personal use, and to enable them to establish and maintain their own small business, professional or agricultural enterprises. This property will be known as "set-asides," and will be available first to veterans, without regard to any other priorities. The present law is amended by making it clear that the governmental priority is subordinate to "set-asides" for veterans. The new law does not require that all surplus property must be set aside for exclusive disposal to veterans, but it does provide that, where a type of property lends itself to economic disposal to individual veterans and is a type particularly desired by veterans, the Administrator at his sole discretion may order a "set-aside" of as much of this property as he determines to be appropriate for exclusive disposal to veterans. This provision should materially aid veterans to acquire what they want.

2. Another important change in the law is that which raises the general priority of veterans who wish to acquire surplus property for their own small business, professional or agricultural enterprises. This change is especially important in regard to surplus property that has not been set aside by the War Assets Administrator for exclusive disposal to veterans. The former law granted priorities first to governmental agencies, second to states and political subdivisions and instrumentalities, and then to veterans. The new law will change this order by giving the veterans a mandatory priority directly after the priority of governmental agencies. This change should make a greatly increased amount of surplus property available to veterans to aid them in establishing their own small business, professional or agricultural enterprises.

3. The right of the Reconstruction Finance Corporation to exercise the pri-

ority given to governmental agencies in purchasing surplus property for resale to small business when, in the judgment of the corporation, such disposition is required to preserve and strengthen the competitive position of small business has been reduced in its priority position. The new law makes it clear that such purchases shall be made after the general priority for veterans, although the Reconstruction Finance Corporation retains its priority over states, political subdivisions and instrumentalities.

4. The new law contains the provision that no governmental agency may transfer any property to any other governmental agency without reimbursement or transfer of funds, unless the authority for such transfer is contained in a law approved on or after June 22, 1944. There had grown up the practice among governmental agencies of exchanging large quantities of surplus property between them without regard to appropriations and without the transfer of any funds between the agencies. This practice prevented a substantial amount of surplus property from being declared surplus and becoming available for sale to veterans. The provision that authority for the transfer must be contained in a law approved on or after June 22, 1944, was made to permit transfers by the War and Navy Departments of hospitals and hospital equipment and supplies to the Veterans Administration without reimbursement as provided in the Surplus Property Law of 1944, which was approved on that date. Thus, indiscriminate transfers without reimbursement between other governmental agencies, including the War Department and the Navy Department, will be stopped by this law.

In discussing this bill, the committee of the House of Representatives stated that one of the purposes of the bill is to see that the surplus property desired by the veterans falls into the hands of the veterans, although the committee recognized that the number of veterans who will receive surplus property will be small compared with the large number of ex-servicemen. The committee also recognized that members of Congress will still receive a great amount of criticism from disappointed veterans, who may think that the new law, increasing their priority, will assure them of an opportunity to acquire all of the surplus property they may desire. The committee stated that it did not think it possible to set up a system of priorities among veterans themselves.

From the time of the introduction of the first bills regarding surplus property for veterans, the War Service and Postwar Planning Committee of the American Dental Association has been active in regard to the provisions of the law relating to the availability of surplus dental property to dental veterans, and has consistently urged the enactment of this legislation. It is the opinion of the War Service and Postwar Planning Committee that this legislation should make more dental equipment available to dental veterans within a short time.—*Carl O. Flagstad, Chairman; George H. Fox, Secretary.*

PROPOSED AMENDMENTS TO THE VETERANS ADMINISTRATION LAW

At the time the present law to establish a Department of Medicine and Surgery in the Veterans Administration was before Congress, the Committee on Legislation of the American Dental Association pointed out to the Veterans Administration that there were certain defects in the bill relative to the dental setup

and suggested that certain amendments be made. The officials of the Veterans Administration, however, were eager to have the bill passed as introduced, because of the urgent necessity for immediately securing administrative improvements. It was recognized that the proposed new law would need to be amended in several respects and it was understood that the amendments proposed by the Committee on Legislation of the American Dental Association would be given favorable consideration by the Veterans Administration at the first opportunity.

The officials in the Veterans Administration, both in the Dental Corps and in the Medical Corps, have been very cooperative in accepting our proposed amendments.

The Committee on Legislation wishes to call your attention to the fact that these amendments place dentistry on a complete parity with medicine in all phases in the Veterans Administration.

It is anticipated that these amendments, together with others to be proposed by the Medical Department, will be embodied in a bill to be presented to Congress within a short time.

The following amendments have been drafted by the Committee on Legislation of the American Dental Association and have been accepted by the officials of the Department of Medicine and Surgery in the Veterans Administration. Italics are used to show the changes being made. The amendments read as follows:

To amend an Act entitled "An Act to Establish a Department of Medicine and Surgery in the Veterans Administration," approved January 3, 1946.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that an Act entitled "An Act to Establish a Department of Medicine and Surgery in the Veterans Administration," approved January 3, 1946, Public Law Number 293, 79th Congress, chapter 658, first session, be amended to read as set forth in this bill.

Sec. 2. That Section 4 in said Act be amended to read as follows:

"Sec. 4. There shall be appointed by the Administrator additional personnel as he may find necessary for the medical care of veterans, as follows:

(a) *Physicians,* dentists, and nurses;

(b) Managers, pharmacists, physical therapists, occupational therapists, dietitians; scientific personnel, such as pathologists, bacteriologists, chemists, biostatisticians, and other medical and dental technologists."

Sec. 3. That Section 6 (a) in said Act be amended to read as follows:

"Sec. 6. (a) Appointments of *physicians,* dentists, and nurses shall be made only after qualifications have been satisfactorily established in accordance with regulations prescribed by the Administrator, without regard to civil service requirements."

Sec. 4. That Section 6 (c) in said Act be amended to read as follows:

"Sec. 6. (c) Promotions of *physicians,* dentists, and nurses shall be made only after examination given in accordance with regulations prescribed by the Administrator. Automatic promotions within grade may be made in increments of the minimum pay of the grade in accordance with regulations to be prescribed by the Administrator."

Sec. 5. That Section 6 (d) in said Act be amended to read as follows:

"Sec. 6. (d) *Physicians,* dentists, and nurses in the present Medical Service shall be continued in their present positions until the Administrator shall have determined their qualifications as provided in subsection (a) of this section."

Sec. 6. That Section 7 (a) in said Act be amended to read as follows:

"Sec. 7. (a) The grades and per annum full pay ranges for positions pro-

vided in subsection (a) of section 4 of this Act shall be as follows:

Medical Service

Chief grade, $8,750 minimum to $9,800 maximum.

Senior grade, $7,175 minimum to $8,225 maximum.

Intermediate grade, $6,230 minimum to $7,070 maximum.

Full grade, $5,180 minimum to $6,020 maximum.

Associate grade, $4,300 minimum to $5,180 maximum.

Junior grade, $3,640 minimum to $4,300 maximum.

Dental Service

Chief grade, $8,750 minimum to $9,800 maximum.

Senior grade, $7,175 minimum to $8,225 maximum.

Intermediate grade, $6,230 minimum to $7,070 maximum.

Full grade, $5,180 minimum to $6,020 maximum.

Associate grade, $4,300 minimum to $5,180 maximum.

Junior grade, $3,640 minimum to $4,300 maximum.

Nursing Service

Assistant Director, $5,180 minimum to $6,020 maximum.

Senior grade, $4,300 minimum to $5,180 maximum.

Full grade, $3,640 minimum to $4,300 maximum.

Associate grade, $2,980 minimum to $3,640 maximum.

Junior grade, $2,320 minimum to $2,980 maximum."

Sec. 7. That Section 8 (a) in said Act be amended to read as follows:

"Sec. 8. (a) Within the restrictions herein imposed, the Chief Medical Director may rate any *physician* appointed under subsection (a) of section 4 of this Act as a medical or surgical specialist: provided, that no person shall at any one time hold more than one such rating; *and, provided further, that the Dental Director may rate any dentist appointed under subsection (a) of section 4 of this Act as a dental specialist.*"

Sec. 8. That Section 8 (b) in said Act be amended to read as follows:

"Sec. 8. (b) No person may be rated as a medical, surgical *or dental* specialist unless he is certified as a specialist by an American specialty board, recognized by the Administrator where such boards exist; or if no such boards exist, he has been examined and found qualified by a board appointed by the Chief Medical Director from specialists of the Department of Medicine and Surgery holding ratings in the specialty to which the candidate aspires: provided, that, whenever there are insufficient specialists, rated in the proper specialty, who are readily available to constitute such a board, the Chief Medical Director may substitute consultants with comparable qualifications employed under section 14 of this Act."

Sec. 9. That Section 8 (c) in said Act be amended to read as follows:

"Sec. 8. (c) Any person, rated as a medical, surgical or *dental* specialist under the provisions of this section, shall retain such rating until it shall be withdrawn by the Chief Medical Director: provided, that the Chief Medical Director shall not withdraw any such rating until it shall have been determined by a board of specialists that the person holding such rating is no longer qualified in his specialty."

Sec. 10. That Section 8 (d) in said Act be amended to read as follows:

"Sec. 8. (d) Any person, rated as a medical, surgical *or dental* specialist under the provisions of this section, shall receive, in addition to his basic pay, an allowance equal to 25 per cent of such pay: provided, that in no event shall

the pay plus the allowance authorized by this subscription exceed $11,000 per annum."

Sec. 11. That Section 10 (a) in said Act be amended to read as follows:

"Sec. 10. (a) The Chief Medical Director, under such regulations as the Administrator shall prescribe, shall from time to time appoint boards to be known as disciplinary boards, each such board to consist of not less than three or more than five employees, senior in grade, of the Department of Medicine and Surgery, to determine, upon notice and fair hearing, charges of inaptitude, inefficiency, or misconduct of any person employed in a position provided in subsection (a) of section 4 of this Act: *provided, that, when such charges concern a dentist, the majority of employees on the disciplinary board shall be dentists.*"

Sec. 12. That Section 12 in said Act be amended to read as follows:

"Sec. 12. The Administrator shall establish a special medical advisory group composed of members of the medical, *dental,* and allied scientific professions, nominated by the Chief Medical Director, whose duties shall be to advise the Administrator, through the Chief Medical Director, and the Chief Medical Director direct, relative to the care and treatment of disabled veterans, and other matters pertinent to the Department of Medicine and Surgery. The special medical advisory group shall conduct regular calendar quarterly meetings. The number, terms of service, compensation, and allowances to members of such advisory group shall be in accord with existing law and regulations."—*Carl O. Flagstad, Chairman; George H. Fox, Secretary.*

PROSTHETIC DENTAL SERVICE COMMITTEE

THE DENTIST AND THE DENTAL LABORATORY

The following article by Adolph W. Froehlke is the first of a series of articles written by laboratory operators under the sponsorship of the Prosthetic Dental Service Committee. The purpose of this series of articles is to encourage a better understanding between the dentist and the dental laboratory. This is done with the expectation that the quality of the service rendered to the public will be improved.

Mr. Froehlke owns and operates a dental laboratory in Oshkosh, Wis. He is president of the Associated Dental Laboratories of Wisconsin and is a highly respected leader in the dental laboratory industry.—Carl O. Boucher, Secretary.

In 1884, Frank F. Eddy approached Dr. W. H. Stowe with a plan to open the first dental laboratory in the world. Since then, the dental laboratory has grown side by side with dentistry.

It is important that the dentist recognize that his interests are closely associated with the welfare of his dental laboratory and that he cannot afford to take unfair advantage of it. The dental laboratory business, like other businesses, must be conducted for profit. Failure to adopt sound business principles has precipitated many a well-meaning dental laboratory operator into a policy of selling below cost and has led him to disregard ethics and to violate dental laws.

The majority of the common sources of friction between the dentist and the dental laboratory can be eliminated. Discussion of some of the things which dentists do or fail to do may help improve the relations of the dentist and the dental laboratory. The need to remake or reset dentures is probably the most frequent cause of friction. Unfortunately, some dentists are of the opinion that laboratory processing is always responsi-

ble for the poor dentures. However, preparations taken by the dentist are frequently in error when they reach the dental laboratory.

I would like to point out several of the errors made by some dentists which result in unsatisfactory dentures and cause friction between dentists and laboratories. When making a hard base plate, the dentist should carefully trim the plate so that it will rest on the ridges and not on peripheral muscles or surplus parts of the model. The inaccurate "mush bite" technic should not be used. A separate impression should be made for the opposing occlusion, preferably with a material other than modeling compound.

Preparations for dentures to be relined or duplicated are often inexact when they reach the laboratory. Perhaps a dentist sends in a denture to be relined without first cutting out the undercuts from the denture; or, if the denture is to be rebased, the bite is not checked and thus the impression material is unevenly distributed in the palate; or the denture to be rebased is sent with a wash in the denture and a new model. The practice of sending an old partial denture for an addition or repair together with a new model causes friction at the laboratory. Preparations for occlusal rests are often forgotten or ignored.

Finishing a case without trying it in the mouth is a procedure which is responsible for a high percentage of the cases that must be remade. Sometimes the dentist has not familiarized himself with the molds and shades of the various manufacturers. All shade matching should be completed at the dental chair with the up-to-date shade guides that are made by the manufacturer of the particular tooth used for the case.

The success or failure of impression materials is a responsibility which the laboratory proprietor cannot assume. Correctly processed and well-fitting partial dentures are often returned to the laboratory by the dentist with the statement that they did not fit the mouth, although they fitted the model perfectly. All laboratories have accepted cases which should have been rejected because the dentist did not take sufficient time and care in obtaining the impression.

Time required for processing is another element which causes friction. Most laboratories are willing to go to great lengths to meet the dentist's demands for extraordinary service. It is easy, therefore, for the dentist to abuse these readily obtained service gestures. The dentist should be willing to assume a share in the responsibility for unavoidable delays in processing, repairing and delivering prosthetic appliances.

Dentists often make requests which are beyond the sphere of the laboratory man's responsibilities. While these requests are frequently made in good faith, they usually indicate that the dentist lacks confidence in himself or that, in order to shorten his office procedure, he is willing to invite the laboratory man to stand at the door of licensed professionalism. Both the dentist and the laboratory man should frown on practices such as having the patient come to the laboratory or having the laboratory man assist at the chair.

To bring about a better relationship between the dentist and the dental laboratory, I therefore recommend:

1. A close liaison between both state and national prosthetic dental service committees and organized dental laboratory associations.

2. The liberal use of existing dental and dental laboratory magazines and journals to correct abuses and to place on the proper party the responsibility for failures in dental appliances.

3. Expansion of dental educational facilities to include courses for dental technicians.—*Adolph W. Froehlke, Oshkosh, Wis.*

COUNCIL ON DENTAL THERAPEUTICS

ACCEPTED DENTAL REMEDIES

Admission of a product to the list of Accepted Dental Remedies means that the product and the methods by which it was marketed at the time of consideration were not found to be in violation of the Council's published rules. Accepted products are reconsidered periodically. The files of the Council contain information on many drugs and dental cosmetics which is available upon request and inquiries are welcomed.—Donald A. Wallace, Secretary.

The Council on Dental Therapeutics of the American Dental Association announces the inclusion of the following products in the list of Accepted Dental Remedies:

Anesthetics—Local[1]

Procaine HCl 2%, Epinephrine 1: 25,000.

Procaine HCl 2%, Epinephrine 1: 50,000: Composition: See S. F. Durst Company, Philadelphia. Distributed by M. Larson Company, Inc., Chicago.

Procaine HCl 2%, Epinephrine 1: 25,000: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; epinephrine, 0.00004 gm.; sodium bisulfite, 0.0019 gm.; sodium chloride, 0.0037 gm.; chlorobutanol, 0.005 gm.; and distilled water.

Procaine HCl 2%, Epinephrine 1: 50,000: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; epinephrine, 0.00002 gm.; sodium bisulfite, 0.0019 gm.; sodium chloride, 0.0037 gm.; chlorobutanol, 0.005 gm.; and distilled water.

Procaine HCl 2%, Neo-Synephrine HCl 1:2,500: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; neo-synephrine HCl (Stearns), 0.0004 gm.; sodium bisulfite, 0.0019 gm.; sodium chloride, 0.0037 gm.; chlorobutanol, 0.005 gm.; and distilled water. Marketed in tubes, 2.3 cc. Manufactured by the Safco Laboratories, Chicago.

Procaine HCl 2%, Epinephrine 1: 25,000: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; epinephrine, 0.00004 gm.; sodium chloride, 0.0045 gm.; disodium phosphate, 0.0006 gm.; sodium bisulfate, 0.002 gm.; in distilled water.

Procaine HCl 2%, Epinephrine 1: 50,000: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; epinephrine, 0.00002 gm.; sodium chloride, 0.0045 gm.; disodium phosphate, 0.0006 gm.; sodium bisulfate, 0.002 gm.; in distilled water.

Procaine HCl 2%, Neo-Synephrine HCl 1:2,500: Each cubic centimeter is stated to contain procaine hydrochloride, 0.02 gm.; neo-synephrine HCl 0.0004 gm.; disodium phosphate, 0.0006 gm.; sodium chloride, 0.0045 gm.; sodium bisulfate, 0.002 gm.; in distilled water. Marketed in 2.3 and 1.8 cc. cartridges. Manufactured by Oradent Chemical Co., Inc., a division of Mizzy, Inc., New York City.

Dentifrices[2]

Irrizol Tooth Paste: Composition: See Milk-I-Dent Dental Cream. Manufactured and distributed by Trade Laboratories, Inc., Newark, N. J.

1. A.D.R. Ed. 11, p. 39.

2. A.D.R. Ed. 11, p. 93.

KALMOR ETYHL CHLORIDE ANALGESIA DEVICE—NOT ACCEPTABLE FOR A.D.R.*

The Kalmor Ethyl Chloride Analgesia Device, marketed by the Kalmor Manufacturing Company of Cleveland, is widely promoted to the profession through the medium of advertising pamphlets and advertisements in certain dental journals.

The device consists essentially of a small metallic chamber containing a 60 cc. bottle of ethyl chloride and equipped with a nose piece, the entire apparatus being designed to fasten over the nose and forehead by means of a band around the head. A rubber tube leads from it to a rubber bulb which the patient holds in his hand. As he squeezes the bulb, air is forced into the analgesia device and carries the vapors of the ethyl chloride into the patient's nasal passages. It is stated that the patient is unable to get an overdose of the drug, because he can no longer manipulate the bulb when he approaches the state of anesthesia. The entire device weighs approximately one pound.

In a promotional pamphlet entitled "Practical Suggestions on Everyday Use of Patient Controlled Ethyl Chloride Analgesia," the following indications are given for its use in dentistry: (1) excavation of sensitive cavities; (2) incision of abscesses; (3) correction of traumatic occlusion; (4) incision of gum flap over third molars; (5) preparation of bridge abutments and porcelain jacket abutments; (6) curettage and scaling in deep pyorrheal pockets; (7) pulp extirpations; (8) extraction of pyorrheal or deciduous teeth; (9) relief of pain when the patient objects to a hypodermic injection; (10) dressing and flushing dry sockets, etc.

The advertising literature carries a brief discussion of the pharmacology of ethyl chloride with no mention of some of its undesirable characteristics. Such advantages as rapid induction, rapid recovery, freedom from nausea, no excitement stage, stability of the drug, pleasant odor and lack of respiratory irritation are all stressed. On the other hand, there is no mention of the fact that ethyl chloride is inflammable and should not be used near a flame. No dangers are reported for this drug and yet Sollman says, ". . . relatively small amounts may cause stoppage of the heart . . ." (Manual of Pharmacology, page 768). Guedel and Knoefel report that ethyl chloride is second to chloroform as a possible cause of ventricular fibrillation in anesthesia (Am. J. Surg. 34:496-499, December 1936). The Council is aware that such occurrences during a brief period of analgesia would be extremely rare, but since there is such a potential danger, it seems pertinent to point out that the average dental office is not equipped to handle such accidents and that even with the best of equipment and in the most expert hands, they are often not reversible.

Cushny warns that ethyl chloride should not be used in greater quantities than 4 to 5 cc. (Pharmacology and Therapeutics, 11th ed., page 343). No evidence was presented to the Council in regard to the quantity of ethyl chloride used in individual operations by this method of analgesia, but if jacket crown and bridge abutments are to be prepared under it, the period of use would necessarily be long. The Council feels that this point must be carefully checked.

One of the points stressed in the promotional literature for the Kalmor Analgesia Device is that no previous experience in anesthesia or analgesia is necessary. It is the opinion of the Council that the tendency to use either general

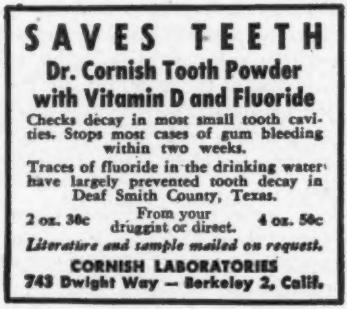
*The Council on Dental Therapeutics has authorized publication of this report.

anesthesia or analgesia without special training in its administration and in the handling of anesthetic accidents is a dangerous trend. Therefore the Council will accept no device for general anesthesia or analgesia which is advertised as requiring no special training for its use.

The Council also has questioned the name "Kalmor Analgesia Device" as being uninformative and unacceptable under Rule 8. The Kalmor Manufacturing Company has agreed to make the name more informative and has made some moves toward more accuracy in its advertising since the Council undertook consideration of its device. However, it is the opinion of the Council that available evidence does not establish the effectiveness and safety of Kalmor Analgesia Device under conditions of use as presently advertised by the company. Therefore, it has been declared unacceptable for A.D.R. The Council plans a general study of the place of analgesia in operative dentistry and will give careful consideration to any further controlled evidence which may be presented on behalf of Kalmor or other analgesia devices.

DR. CORNISH'S TOOTH POWDER—NOT ACCEPTABLE FOR A.D.R.*

Dr. Cornish's Tooth Powder is manufactured by the Cornish Laboratories, Berkeley, Calif. Letters from the firm are signed, "Dr. Robert E. Cornish, President." The product is stated to contain vitamin D, calcium fluoride in the form of fluorite, and urea. Preliminary tests in the A.D.A. Bureau of Chemistry indicate that the bulk of the product consists of calcium carbonate and calcium phosphate. The firm has declined to reveal the composition. Claims for the product are essentially that it cleans, hardens and preserves the teeth, that it stops decay in most small tooth cavities and that it cures most cases of gum bleeding within two weeks. A typical advertisement is shown.


SAVES TEETH
Dr. Cornish Tooth Powder
with Vitamin D and Fluoride
Checks decay in most small tooth cavities. Stops most cases of gum bleeding within two weeks.
Traces of fluoride in the drinking water have largely prevented tooth decay in Deaf Smith County, Texas.
2 oz. 30c
From your druggist or direct.
4 oz. 50c
Literature and sample mailed on request.
CORNISH LABORATORIES
743 Dwight Way — Berkeley 2, Calif.

The Council is not aware of evidence adequate to support the claims for this product made in the advertising and on the labels. The use of the title "Dr." as part of the name of the product is misleading and in violation of the Council's rules. Dr. Cornish's Tooth Powder is therefore not acceptable for A.D.R.

*The Council on Dental Therapeutics has authorized publication of this report.

BUREAU OF PUBLIC RELATIONS

ORAL CANCER EXHIBIT WINS THIRD PRIZE AT INDUSTRIAL HEALTH CONFERENCE

The oral cancer exhibit prepared by the Bureau of Public Relations of the American Dental Association won third prize for scientific exhibits at a conference of industrial dentists, physicians, surgeons, nurses and hygienists at the Sherman Hotel, Chicago, April 7-13.

The exhibit consists of five panels of full-color kodachrome photographs of actual cases of cancer of the mouth, each illuminated to obtain the full color effect.

Titles of the panels are: (1) "Oral Cleanliness Helps Prevent"; (2) "Early Lesions May Be Curable"; (3) "Early Diagnosis Helps Save Lives"; (4) "Ten Per Cent of Recognized Cancers Occur on the Lips or Within the Mouth"; and (5) "Late Cancer Is Difficult to Treat." The display was prepared in cooperation with the American Cancer Society.

Some 1,600 persons attended the conference. Participating organizations were the American Association of Industrial Dentists, the American Association of Industrial Physicians and Surgeons, the American Association of Industrial Nurses, the American Industrial Hygiene Association and the National Conference of Governmental Industrial Hygienists.

The exhibit is available for loan to state and component societies.

TWO NEW RADIO SCRIPTS ON DENTAL HEALTH DISTRIBUTED TO LOCAL SOCIETIES

Two new radio scripts dealing with dental health proposals of the American Dental Association were issued by the Bureau of Public Relations during May.

One fifteen-minute script entitled "Dental Health Goals for America" requires the participation of two dentists and an announcer. It presents the five-year dental health goals recently established by the Council on Dental Health of the American Dental Association. The other, a five-minute talk, is entitled "Dental Health for America."

Both scripts were prepared for use over local radio stations by component dental societies. Copies of the scripts have been mailed to secretaries of all societies, and additional copies can be procured without charge from the Bureau of Public Relations.

A new series of six five-minute transcriptions, "Dental Health for America," also is available for use by local societies on radio stations in their communities. Each transcription features a short dramatic episode followed by a brief message on the importance of proper dental care. The series was written by Harriet Hester and produced by the Bureau of Public Relations in cooperation with the Health Advisory Council of the U. S. Chamber of Commerce.

Also available from the radio library of the Bureau are a series of thirteen transcriptions, "Tales from Ivory Towers," and nearly 300 individual scripts in lecture and dialogue form. Catalogues of this material can be obtained by sending a postcard to the Bureau of Public Relations.

LIST OF NAVY DENTAL OFFICERS SEPARATED FROM SERVICE

The following officers have been separated from the Dental Corps of the U. S. Navy. This list is not complete. Publication will be given to other names as soon as possible.

Alabama

Birmingham	King, John M.	Lt. Cmdr.
Birmingham	Lokey, C. W., Jr.	Lieut.
Blountsville	Bains, Henry L.	Cmdr.
Jackson	McLeod, Allan L.	Lieut.
Loxley	Childress, Alfred C.	Lieut.
Opelika	Hughlett, Robert B.	Lieut.
Sylacauga	Matthews, Murray C.	Lieut.

Arizona

Chandler	Pace, Lemuel R.	Lieut.
Willcox	Wilson, John C.	Lt. Cmdr.

Arkansas

Arkadelphia	Strong, James E.	Lt. Cmdr.
Batesville	Grammer, N. A.	Lieut.
Clarksville	King, Andy R.	Lieut.
Heber Springs	Robbins, W. E.	Lt. Cmdr.
Mena	Goforth, Gerald W.	Lieut.

California

Alameda	Garfinkle, Victor I.	Lieut.
Alhambra	Edmunds, Robert W.	Lieut.
Alhambra	Koontz, Walter R.	Lieut.
Alhambra	Wenzlaff, E. L.	Lt. Cmdr.
Altadena	Buck, Douglas D.	Lt. Cmdr.
Altadena	Garvey, E. P.	Lt. Cmdr.
Arcata	Domeyer, Leland H.	Lieut.
Berkeley	Green, Maurice S.	Lieut.
Berkeley	Harshman, T. R.	Lieut.
Berkeley	Milne, Carrol S.	Lt. Cmdr.
Beverly Hills	Muff, Roy H.	Lieut.
Beverly Hills	Pace, Gordon R.	Lt. Cmdr.
Carmel	Slipner, Del L.	Lt. Cmdr.
Colton	Bull, Horace W.	Lieut.
Compton	Federle, Kenneth W.	Lieut.
Compton	Ralls, Morgan S.	Lieut.
Coronado	Frame, Carl H.	Cmdr.
Crescent City	DeMartin, L. C.	Lieut.
Downey	Morrison, John W.	Lieut.
Downey	Strang, Schyler P.	Lieut.
El Cerrito	Bird, Sexton F.	Lieut.
Emigrant Gap	Bovee, John C.	Lieut.
Encinitas	Kimball, Rulon J.	Lieut.
Encino	Pedersen, H. G.	Lt. Cmdr.
Encino	Ruedy, K. G.	Lt. Cmdr.
Eureka	Wrigley, M. J.	Lt. Cmdr.
Fresno	Smith, Elbert H.	Lieut.
Glendale	Andree, Carl C.	Lieut.
Glendale	Boring, Eugene H.	Lieut.
Glendale	Hall, Bertin E.	Lt. Cmdr.
Glendale	Hudson, Arthur L.	Lieut.
Glendale	Wurtz, Arthur A.	Lieut.
Hanford	Bullard, Harry G.	Cmdr.
Hayward	Wieser, William F.	Lieut.
Haywood	Rheiner, Robert N.	Cmdr.
Huntington Park	Page, Norman R.	Lieut.
Huntington Park	Thompson, R. W.	Lieut.
Inglewood	Matson, Carlin O.	Lieut.
Kentfield	Potter, Dalzell J.	Lt. Cmdr.
La Canada	Peterson, S. B.	Lt. Cmdr.
Lafayette	Hamlin, Dana A.	Lt. Cmdr.
La Jolla	Stephen-Hassard, Q. M.	Lt. Cmdr.
Long Beach	Bayne, Donald H.	Lieut.
Long Beach	Pitman, LeRoy E.	Cmdr.
Long Beach	Schmitt, Raymond S.	Lieut.
Long Beach	Steinberg, Leo L.	Lieut.
Long Beach	Todd, Earl J.	Lieut.
Los Angeles	Bleak, Alfred C.	Lieut.
Los Angeles	Brand, Julian A.	Lieut.
Los Angeles	Brann, E. S., Jr.	Lieut.
Los Angeles	Burns, Robert P.	Lt. Cmdr.
Los Angeles	Congdon, Jack N.	Lieut.
Los Angeles	Conley, Francis J.	Lt. Cmdr.
Los Angeles	Cunningham, I. J.	Lieut.
Los Angeles	Doughty, S. D.	Lt. Cmdr.
Los Angeles	Franco, Louis J.	Lieut.
Los Angeles	Garnhart, Warren C.	Lieut.
Los Angeles	Grant, Robert A.	Lt. Cmdr.
Los Angeles	Hurst, Oscar E.	Lieut.
Los Angeles	Johnson, G. S.	Lt. Cmdr.
Los Angeles	Johnson, Leslie H.	Lieut.
Los Angeles	Klingstein, H. A.	Lieut.
Los Angeles	Lamb, Frank W.	Lieut.
Los Angeles	LeLansky, Ross S.	Lt. Cmdr.
Los Angeles	McDermott, Leo H.	Lieut.
Los Angeles	Malkin, Bernard F.	Lieut.
Los Angeles	Marsh, A. J.	Lt. Cmdr.
Los Angeles	Martin, Floyd B., Jr.	Lieut.
Los Angeles	Mostovoy, Joseph	Lt. Cmdr.
Los Angeles	Murphy, John W.	Lieut.
Los Angeles	Nedelman, C. I.	Lt. Cmdr.
Los Angeles	Newton, Floyd N.	Lieut.
Los Angeles	Openshaw, R. W.	Lt. Cmdr.
Los Angeles	Packard, Robert W.	Lieut.
Los Angeles	Parker, Wilmer E.	Lieut.
Los Angeles	Rolston, Richard T.	Lieut.
Los Angeles	Schneberg, William J.	Lieut.
Los Angeles	Schurmer, R. W.	Lt. Cmdr.
Los Angeles	Stevens, Robert W.	Lieut.
Los Angeles	Taub, Ernest D.	Lieut.
Los Angeles	Thompson, E. B.	Lt. Cmdr.
Monterey	Ashton, Vahe A.	Lt. Cmdr.
National City	Bodily, David C.	Lieut.
N. Hollywood	Foell, Guy H.	Lt. Cmdr.
N. Hollywood	Kuhlen, F. E. V.	Lieut.
Oakland	Bornholdt, Irwin C.	Lieut.
Oakland	Borsuk, Harold	Lt. Cmdr.
Oakland	Bortfeld, William E.	Lieut.
Oakland	Garrelts, Arthur W.	Lieut.
Oakland	Greenlaw, W. W.	Lt. Cmdr.
Oakland	Hechtman, J. H.	Lt. Cmdr.

Oakland	Packwood, Frank L.	Lieut.
Oakland	Pavone, Benjamin W.	Lieut.
Oakland	Roberts, Thomas L.	Lieut.
Oakland	Scott, James W.	Lt. Cmdr.
Oakland	Stock, Clarence A.	Capt.
Oakland	Tambling, G. L.	Lt. Cmdr.
Oakland	Wickes, G. R.	Lt. Cmdr.
Oceanside	Sunstrom, Frank F.	Lieut.
Ojai	Clow, Howard J.	Lieut.
Pacific Beach	McDavitt, G. W.	Lt. Cmdr.
Pacific Grove	Hart, Archie J.	Lt. Cmdr.
Pacific Palisades	Walsh, Eugene A.	Lt. Cmdr.
Pasadena	Foley, Carl E.	Lt. Cmdr.
Pasadena	Olmsted, Charles S.	Lieut.
Pasadena	Thomas, David H.	Lieut.
Pomona	Bush, Beverely F.	Lt. Cmdr.
Pomona	Moss, Marvin D.	Lieut.
Reseda	Cushnie, Albert W.	Cmdr.
Richmond	Durnell, Orlis J.	Lieut.
Richmond	Veranth, Charles O.	Lieut.
Riverside	Anderson, E. W.	Lt. Cmdr.
Ross	Shaw, Perry M.	Capt.
Sacramento	Chenu, Aaron C.	Lt. Cmdr.
Sacramento	Snow, George O.	Lt. Cmdr.
Sacramento	Taylor, Clark T.	Lieut.
Salinas	Meyenberg, Walter J.	Lieut.
San Bernardino	Voss, Henry H.	Lieut.
San Diego	Armstrong, Charles B.	Lieut.
San Diego	Campbell, John S.	Lieut.
San Diego	Casares, Ernest L.	Lieut.
San Diego	Conrad, John F.	Lieut.
San Diego	Delpho, Donald A.	Lieut.
San Diego	Emery, Sam R.	Lieut.
San Diego	Raffel, Arnold M.	Lieut.
San Diego	Taylor, Willis C.	Lt. Cmdr.
San Diego	Trotter, Rayse R.	Lieut.
San Fernando	Paden, Randall	Lieut.
San Francisco	Bowles, Joseph M.	Lieut.
San Francisco	Covington, W. E.	Lt. Cmdr.
San Francisco	Danneker, Robert A.	Lieut.
San Francisco	Holloway, W. A., Jr.	Lieut.
San Francisco	Ludwigsen, Lawrence	Lieut.
San Francisco	Mack, Edward S.	Lieut.
San Francisco	McMurdo, B. H.	Lieut.
San Francisco	Putzke, Gustav F.	Lieut.
San Francisco	Rasori, Philip A.	Lt. Cmdr.
San Francisco	Renselaer, G. H.	Lt. Cmdr.
San Francisco	Spridgen, William A.	Capt.
San Francisco	Springer, Charles G.	Lieut.
San Francisco	Throndson, A. H.	Lt. Cmdr.
San Francisco	Valois, Milton W.	Lieut.
San Francisco	Vogt, Delbert R.	Lieut.
San Francisco	Wait, Elwood L.	Lt. Cmdr.
San Jose	Dickter, M. R.	Lt. Cmdr.
San Mateo	Masterson, T. H.	Lieut.
Santa Cruz	Jarvis, Wayne W.	Lieut.
Santa Cruz	Melling, Horace A.	Lieut.
Santa Monica	Harris, Garwin L.	Lieut.
Santa Monica	Symington, Lee G.	Lieut.
Santa Rosa	Tepper, Harry W.	Lieut.
Tiburon	Flint, John H.	Lt. Cmdr.
Vallejo	Kite, Ben Z.	Lt. Cmdr.
Van Nuys	Miller, Brigham S.	Lieut.
Vista	Carpenter, H. L.	Lt. Cmdr.

Canada

Windsor, Ont.	Brisson, Eldon	Lt. Cmdr.

Colorado

Denver	Nassimbene, Jack D.	Lieut.
Denver	Neuman, H. A.	Lt. Cmdr.
Denver	Simon, W. H., Jr.	Lieut.
Denver	Smedley, Charles W.	Lieut.

Connecticut

Bridgeport	Cholko, Alphonse F.	Lieut.
Bridgeport	Wheeler, G. E.	Lt. Cmdr.
Bristol	Cawley, Peter A.	Lieut.
Danbury	Buchman, M.	Lt. Cmdr.
Greenwich	Bassett, H. H.	Lt. Cmdr.
Guilford	Smith, Winthrop F.	Lieut.
Naugatuck	Heacock, Albert W.	Lieut.
New Britain	Granski, Joseph A.	Lieut.
New Haven	Delfini, Anio P.	Lieut.
New Haven	Iaccarino, Peter H.	Lieut.
New Haven	Snyder, Albert K.	Lieut.
Portland	Edelberg, Nathan	Lieut.
South Norwalk	Hadik, S. E.	Lt. Cmdr.
Stratford	Garneau, P. J.	Lt. Cmdr.
Torrington	Maine, Edmund J.	Lieut.
Waterbury	Blanchard, K. E.	Lieut.
Waterbury	Mastroianni, V. M.	Lieut.
Westport	Sporbert, Curtis P.	Lieut.

Delaware

Wilmington	McAllister, Henry H.	Lieut.

District of Columbia

Washington	Callahan, Lynn T.	Lieut.
Washington	Cohen, Maxwell L.	Lieut.
Washington	Garcia, Ernest	Lieut.
Washington	Gillroy, Kenneth M.	Lieut.
Washington	Hirsch, Jacob H.	Lieut.
Washington	Jani, George M.	Lt. Cmdr.
Washington	Lynch, Daniel F.	Cmdr.
Washington	Sheehy, Maurice J.	Lieut.
Washington	Smallwood, W. L.	Lt. Cmdr.

Florida

Daytona Beach	Thompson, E. L.	Lt. Cmdr.
Jacksonville	Cramer, Harold A.	Lieut.
Jacksonville	Taylor, R. P., Jr.	Lieut.
Jacksonville	Taylor, William S.	Lieut.
Key West	Carmona, Jesus E.	Lieut.
Lake Worth	Pirkle, Stanley O.	Lt. Cmdr.
Miami	Berke, Jerome	Lt. Cmdr.
Miami	Surcliffe, R. A.	Lt. Cmdr.
Pensacola	Berman, C. A., Jr.	Lieut.
Pensacola	De La Rua, Max	Lt. Cmdr.
Tallahassee	Proctor, Earl W.	Lieut.
Tampa	Cawthon, E. H.	Lt. Cmdr.
Tampa	Fisher, Olger O.	Lieut.
Tampa	Paniello, Mariano G.	Lieut.
Tampa	Thomas, Robert W.	Lieut.
Tampa	Woodward, H. E.	Lt. Cmdr.
Warrington	Lotz, James W.	Lieut.
W. Palm Beach	Bowen, James P.	Lt. Cmdr.

Georgia

Atlanta	Gabrels, Wilton R.	Lieut.
Atlanta	Henry, Andrew A.	Lieut.
Atlanta	Jordan, John R., Jr.	Lieut.
Atlanta	Margeson, R. M., Jr.	Lieut.
Atlanta	Robertson, H. M., III	Lieut.
Atlanta	Warren, G. D.	Lt. Cmdr.

Elberton	Herndon, C. F., Jr.	Lt. Cmdr.
Hogansville	Head, George B., Jr.	Lieut.
Macon	Boon, Toof A.	Lt. Cmdr.
Nelson	Turk, Tully R.	Lieut.
Statesboro	Lane, Julian C.	Lieut.

Idaho

Moscow	Miller, Howard F.	Lieut.
Sandpoint	Smith, Cyril A.	Lieut.
Twin Falls	Carpenter, Frank E.	Lieut.
Twin Falls	Sutcliff, Robert J.	Lieut.

Illinois

Alton	Hemphill, Charles J.	Lieut.
Alton	Maley, Paul A.	Lieut.
Alton	Widger, Floyd E.	Lt. Cmdr.
Arcola	Phillips, John A.	Lieut.
Arlington Hts.	Hill, Cyrus E.	Lt. Cmdr.
Ashley	Karstens, Wallace C.	Lieut.
Belleville	Wagner, Myron W.	Lieut.
Berwyn	Filek, Lyle J.	Lieut.
Berwyn	Ness, Charles D.	Lieut.
Berwyn	Oakdale, Ray	Lieut.
Bushnell	Ewan, George E.	Lt. Cmdr.
Chadwick	Holmes, Harold H.	Lieut.
Chicago	Addis, Nathan	Lieut.
Chicago	Ahner, David J.	Lieut.
Chicago	Becker, S. W.	Lt. Cmdr.
Chicago	Biel, Joseph F.	Lieut.
Chicago	Binderman, A. B.	Lieut.
Chicago	Blomgren, B. O.	Lt. Cmdr.
Chicago	Bolewicz, Casimir G.	Lieut.
Chicago	Borderding, Ernest H.	Lieut.
Chicago	Bovik, Ellis G.	Cmdr.
Chicago	Braun, Milton L.	Lieut.
Chicago	Brooks, R. W.	Lt. Cmdr.
Chicago	Brophy, Joseph T.	Lieut.
Chicago	Burke, William B.	Lieut.
Chicago	Cory, Charles D.	Lieut.
Chicago	Dawson, Isaac M., Jr.	Lieut.
Chicago	Dessart, Paul C.	Lieut.
Chicago	Dolnick, Earl C.	Lieut.
Chicago	Drummond, H. A.	Lt. Cmdr.
Chicago	Dugas, Joseph M.	Lt. Cmdr.
Chicago	Evans, John S.	Lieut.
Chicago	Faul, Lawrence P.	Lieut.
Chicago	Feldstein, Louis	Lieut.
Chicago	Fettig, Victor J.	Lt. Cmdr.
Chicago	Fey, Richard W.	Lieut.
Chicago	Galvin, Harold L.	Lt. Cmdr.
Chicago	Gierat, H. L. M.	Lt. Cmdr.
Chicago	Glavin, E. M.	Lt. Cmdr.
Chicago	Goldt, Herbert I.	Lieut.
Chicago	Gubbins, William R.	Lieut.
Chicago	Haebich, Roy A.	Lieut.
Chicago	Hofrichter, J. F.	Lt. Cmdr.
Chicago	Johnson, Milburn H.	Lieut.
Chicago	Kahn, Henry	Lieut.
Chicago	Keenan, James F.	Lieut.
Chicago	Kent, Robert C.	Lieut.
Chicago	Kropidlowski, A. L.	Lt. Cmdr.
Chicago	Lachmann, C. M.	Lt. Cmdr.
Chicago	Larson, Laverne H.	Lieut.
Chicago	Lindholm, E. R.	Lt. Cmdr.
Chicago	Lynch, James N.	Lieut.
Chicago	Melin, Morris M.	Lieut.
Chicago	Munson, Monroe A.	Lieut.
Chicago	Nix, Donald F.	Lt. Cmdr.
Chicago	Olenick, M.	Lt. Cmdr.
Chicago	Pearl, Albert	Lieut.
Chicago	Petrizzi, Albert M. A.	Lieut.
Chicago	Priess, David J.	Lt. Cmdr.
Chicago	Rabin, Bernard I.	Lieut.
Chicago	Rock, Robert J.	Lt. Cmdr.
Chicago	Sakowski, T. P.	Lt. Cmdr.
Chicago	Schuessler, Elmer W.	Cmdr.
Chicago	Schwartz, Maurice B.	Lieut.
Chicago	Sorensen, V. B.	Lt. Cmdr.
Chicago	Spooner, Grant R.	Lieut.
Chicago	Stwertnia, Bruno M.	Lieut.
Chicago	Sulser, Glenn F.	Lieut.
Chicago	Swanson, A. L.	Lt. Cmdr.
Chicago	Tikusis, Stanley R.	Lieut.
Chicago	Vision, Charles S.	Lieut.
Chicago	Weiss, Carlisle	Lieut.
Chicago	Wilkinson, H. M.	Lt. Cmdr.
Chicago	Windauer, R. J.	Lt. Cmdr.
Chicago	Zullo, Peter W.	Lieut.
Chicago Heights	Iagmin, Peter P.	Lt. Cmdr.
Cicero	Starek, William	Lieut.
Decatur	Morrison, John K.	Lieut.
East St. Louis	Kuebel, James A.	Lt. Cmdr.
Elgin	Born, Harold W.	Lieut.
Elgin	Houdek, Norbert J.	Lieut.
Elgin	Rea, Victor S.	Lieut.
Elmwood Park	Schlesinger, William	Lieut.
Evanston	Grover, Floyd E.	Lt. Cmdr.
Evanston	Klein, Eugene G.	Lieut.
Forest Park	Sisson, William J. H.	Lieut.
Glen Ellyn	Farmer, Gilbert J.	Lieut.
Glen Ellyn	Gimbel, Simon E.	Lt. Cmdr.
Harvey	Teeling, Sherman J.	Lieut.
Highland	Tschudy, R. F.	Lt. Cmdr.
Highwood	Anderson, Chester F.	Lieut.
Joliet	Cohenour, Ernest C.	Lieut.
Kankakee	Hagearty, Bernard J.	Lieut.
Kenilworth	McEwen, L. B.	Lt. Cmdr.
La Grange	Ackerman, Harold E.	Lieut.
Lake Forest	Mitchell, Merrell L.	Lieut.
Lake Forest	Tedrow, Brice H.	Lieut.
La Salle	Lees, Harry M.	Lieut.
Libertyville	Wilde, Leslie E.	Lt. Cmdr.
McLeansboro	Winfree, C. R.	Lt. Cmdr.
Moline	Ortman, Charles F.	Lieut.
Moline	Ortman, Clarence H.	Lieut.
Nashville	Schroeder, F. W.	Lt. Cmdr.
Oak Lawn	Bromboz, Chester E.	Lieut.
Oak Park	Lewis, Charles W.	Lieut.
Onarga	Workman, H. R.	Lt. Cmdr.
Peoria	Cavitt, Howard H.	Lieut.
River Forest	Olsen, Weston O.	Lieut.
Riverside	Prochaska, Gerald	Lieut.
Rockford	Olson, Allen N.	Lieut.
Rockford	Powrie, Donald E.	Lieut.
Round Lake	Cubbon, Henry O.	Lieut.
Springfield	Buchmann, Arthur C.	Lieut.
Springfield	Maxey, Harold G.	Lieut.
Thompsonville	Johnson, W. L., Jr.	Lieut.
Tinley Park	Ryan, Albert J.	Lieut.
Winnetka	Brown, John W.	Lt. Cmdr.
Woodstock	Butler, M. A.	Lt. Cmdr.
Woodstock	Readel, H. H.	Lt. Cmdr.

Indiana

Elkhart	Longenecker, M. C.	Lt. Cmdr.

Evansville	Fisher, George A	Lieut.
Evansville	Yoder, Eugene F.	Lieut.
Greensburg	Gilchrist, John W.	Lieut.
Hammond	Jurgens, Alvin E.	Lt. Cmdr.
Hammond	Powley, John W.	Lieut.
Huntington	Abbott, Herbert H.	Lieut.
Indianapolis	Dawson, Kent C.	Lieut.
Indianapolis	Geller, John W.	Lt. Cmdr.
Indianapolis	Lowery, Charles C.	Lieut.
Indianapolis	McDonald, Ralph E.	Lieut.
Lagrange	Nelson, Albert B.	Lieut.
South Bend	Jarrett, Charles C.	Lieut.
South Bend	Knab, Albert L.	Lieut.
South Bend	Toothaker, J. C.	Lt. Cmdr.
Terre Haute	Nickels, Robert P.	Lieut.
Terre Haute	Price, Byron E.	Lt. Cmdr.
Valparaiso	White, Leo H.	Lt. Cmdr.
Vincennes	Pickard, Robert G.	Lieut.

Iowa

Algona	Schaap, Clarie D.	Lieut.
Britt	Morgan, Harold R.	Lieut.
Burlington	Eisenhart, A. V.	Lt. Cmdr.
Burlington	Orr, Clyde V.	Lt. Cmdr.
Carson	Landon, Arnold G.	Lieut.
Cedar Rapids	Anderson, Ernest W.	Lieut.
Clinton	Allen, Carl S.	Lt. Cmdr.
Creston	Burlington, James R.	Lieut.
Des Moines	Blount, Samuel H.	Lieut.
Des Moines	Kelly, Joseph W.	Lieut.
Griswold	Weir, Lauren W.	Lieut.
Guttenberg	Meder, Donatian E.	Lieut.
Iowa City	Mariner, Jay M.	Lt. Cmdr.
Keokuk	Foglesong, Hubert D.	Lieut.
Keosauqua	Perkins, Charles R.	Lieut.
Lake Mills	Calhoun, Richard E.	Lieut.
Lake Mills	Johnson, Paul	Lt. Cmdr.
Muscatine	Pearlman, Jack L.	Lt. Cmdr.
Oelwein	Sahs, Lorenz W.	Lt. Cmdr.
Osceola	Kierulff, Herbert E.	Lieut.
Osceola	Paschall, Ronald R.	Lieut.
Perry	Worrell, Joseph H.	Lieut.
Primghar	Leemkuil, Rodney W.	Lieut.
Seymour	Scott, Richard L.	Lt. Cmdr.
Tipton	Harris, Hallett J.	Lieut.
Tripoli	Smith, Walter H.	Lt. Cmdr.
Ute	Swanson, C. H. J.	Lieut.
Waucoma	Blong, Joseph L.	Lieut.

Kansas

Abilene	Hampton, G. D.	Lt. Cmdr.
Arkansas City	Miller, Herbert L.	Lieut.
Burrton	Shaw, Ted D.	Lieut.
Clay Center	Montgomery, R. M.	Lieut.
El Dorado	Orr, Robert J.	Lieut.
Emporia	Sommers, S. O.	Lt. Cmdr.
Kansas City	Brown, Charles J., Jr.	Lieut.
Olathe	Tippin, Joseph G.	Lieut.
Wamego	Throop, Gerald B.	Lt. Cmdr.
Wichita	Olson, Reuben E.	Lt. Cmdr.

Kentucky

Beaver Dam	Dunn, Rolland T.	Lieut.
Dayton	Klett, William C.	Lt. Cmdr.
Harlan	Craft, Bennie W.	Lt. Cmdr.
Louisville	Maddox, John C.	Lieut.
Louisville	Monteleone, U. L.	Lieut.
Louisville	Violette, Homer M.	Lieut.
Mt. Vernon	Pennington, James F.	Lieut.
Newport	Charkins, Leo J.	Cmdr.
Pineville	Mills, Shirley M.	Lieut.
Scottsville	Lambert, Carlton G.	Lieut.

Louisiana

Gretna	Harris, Clyde A.	Lt. Cmdr.
Hammond	Fagan, Charles M.	Lieut.
New Orleans	Antonini, George H.	Lieut.
New Orleans	Clark, Vincent T.	Lieut.
New Orleans	Colomb, John J., Jr.	Lieut.
New Orleans	Fabacher, R. W.	Lt. Cmdr.
New Orleans	Griffin, John L.	Lt. Cmdr.
Ruston	Parish, Robert T.	Lieut.

Maine

Auburn	Moulton, A. L.	Lt. Cmdr.
Bath	Warren, Ralph D.	Lt. Cmdr.
Belfast	Lothrop, T. W.	Lt. Cmdr.
Biddeford	Cabana, Joseph A.	Lieut.
Fairfield	Savage, Edwin F.	Lieut.
Machiasport	Starbird, K. I.	Lt. Cmdr.
Madison	Schmidt, M. M.	Lt. Cmdr.
Newport	Moses, Adolph C.	Lt. Cmdr.
Presque Isle	Bonenfant, K. H.	Lieut.

Maryland

Baltimore	Birghenthal, Murray	Lieut.
Baltimore	Fusco, Joseph D.	Cmdr.
Baltimore	Greenberg, A. A.	Lt. Cmdr.
Baltimore	Hoffman, Edward	Lieut.
Baltimore	Loveman, C. E.	Lt. Cmdr.
Baltimore	Roh, Franklin J.	Lt. Cmdr.
Baltimore	Rosen, Irving H.	Lt. Cmdr.
Baltimore	Smyth, Lawrence C.	Lieut.
Catonsville	Steele, Glenn D.	Lieut.
Monkton	Bumgarner, A. S.	Lt. Cmdr.

Massachusetts

Arlington	Kirwin, F. P.	Lt. Cmdr.
Arlington	MacEwen, E. S.	Lt. Cmdr.
Auburndale	Littig, Sibley	Cmdr.
Ayer	McGuane, Phillip A.	Lieut.
Belmont	Clark, Harold L.	Lieut.
Belmont	Mock, Joseph J.	Lieut.
Berkeley	Milne, Carrol S.	Lt. Cmdr.
Boston	Cannon, Francis J.	Lt. Cmdr.
Boston	Reitman, Joseph	Lt. Cmdr.
Boston	Unger, Robert	Lt. Cmdr.
Boston	Weinstein, Frederick	Lieut.
Brighton	Davidson, J. A.	Lt. Cmdr.
Brighton	McGovern, James L.	Lieut.
Brookline	Fain, Archie I.	Lt. Cmdr.
Cambridge	Gardner, Wallace J.	Lieut.
Cambridge	Mulcahy, F. J.	Lt. Cmdr.
Chelsea	Bernstein, Harry B.	Lieut.
Chelsea	Glazer, Samuel G.	Lieut.
Gloucester	Kramer, Philip M.	Lieut.
Great Barrington	Smith, Arthur C.	Lieut.
Haverhill	Chooljian, Hagies R.	Lieut.
Haverhill	Morey, John R.	Lieut.
Haverhill	Ring, Robert D.	Lieut.
Hingham	Rando, John J.	Lieut.
Hyde Park	Mac Leod, K. G.	Lt. Cmdr.
Lawrence	Wheeler, G. W.	Lt. Cmdr.

Lawrence	Zimny, Thaddeus P.	Lieut.
Lee	Mulloney, Leo C.	Lt. Cmdr.
Lexington	Schribner, Charles E.	Lieut.
Lynn	Morrow, Robert E.	Lieut.
Lynn	O'Donnell, R. J.	Lt. Cmdr.
Lynn	Waliackas, E. A.	Lt. Cmdr.
Marshfield Hills	Prario, Robert S.	Lieut.
Mattapan	Weisman, David B.	Lieut.
Melrose	Bissell, Joseph H. F.	Lieut.
Melrose	Connolly, Bernard J.	Lieut.
Milford	Iacovelli, Henry N.	Lieut.
Milford	Marcus, B. R.	Lt. Cmdr.
New Bedford	White, Linden H., Jr.	Lieut.
Newton	Greene, Frank B.	Lieut.
Shrewsbury	Mocca, A. R.	Lt. Cmdr.
Somerville	Baxter, Ralph F.	Lt. Cmdr.
South Boston	Walsh, Thomas F.	Lt. Cmdr.
Springfield	Briskin, Melvin R.	Lt. Cmdr.
Springfield	Gold, Arthur	Lieut.
Springfield	Redden, James A.	Lt. Cmdr.
Turners Falls	Fillebrown, D. O.	Lt. Cmdr.
Wareham	Murray, C. F.	Lt. Cmdr.
Watertown	Kelley, Frederic C.	Lieut.
West Boston	Peters, M. E., Jr.	Lt. Cmdr.
West Newton	Donavan, Ellis J.	Lieut.
Weston	Pinel, Philip J.	Cmdr.
Winchester	Bales, Michael S.	Lieut.
Worcester	Bohlin, Edwin R.	Lieut.
Worcester	Davies, Clinton L.	Lt. Cmdr.
Worcester	Hornbaker, Robert W.	Lieut.
Worcester	Shellhorn, A. J.	Lt. Cmdr.
Worcester	Svenson, Sven O.	Lt. Cmdr.

Michigan

Allegan	Mosier, Joseph E.	Lieut.
Battle Creek	Blackmore, Edward J.	Lieut.
Battle Creek	Ponitz, Paul V.	Lieut.
Bay City	Mohnke, Clifford A.	Lieut.
Birmingham	Deer, Edwin W.	Lieut.
Brighton	Van Ornum, A. E.	Lieut.
Caseville	Beach, Robert A.	Lieut.
Coldwater	McConnell, Olen H.	Lieut.
Dearborn	Muske, Florian A.	Lieut.
Detroit	Allstin, John N.	Lieut.
Detroit	Baker, James P.	Lieut.
Detroit	Brooks, C. R.	Lt. Cmdr.
Detroit	Brown, James C.	Lieut.
Detroit	Cook, Bruce B.	Lieut.
Detroit	Dorsz, Theodore M.	Lieut.
Detroit	Goodfriend, James E.	Lieut.
Detroit	Grob, Albert H.	Lieut.
Detroit	Harris, George S.	Lieut.
Detroit	Katulski, Edward M.	Lieut.
Detroit	Lee, Herbert	Lieut.
Detroit	Lerminey, Frank A.	Lieut.
Detroit	McCaughrin, H. W.	Lieut.
Detroit	Schellig, Robert I.	Lieut.
Detroit	Sherman, Howard M.	Lieut.
Detroit	Stefani, F. G.	Lt. Cmdr.
Detroit	Sullivan, Joseph A.	Lieut.
Detroit	Wallace, Harry E.	Lieut.
Detroit	Yoffee, Melvin R.	Lieut.
East Lansing	Crockett, C. D.	Lt. Cmdr.
Ferndale	Crego, Stanley W.	Lieut.
Flint	Clarke, Jack O.	Lt. Cmdr.
Grand Rapids	Anderson, Carl R.	Lieut.
Grand Rapids	DeYoung, Wesley R.	Lieut.
Grand Rapids	Gessner, Roy C.	Lieut.
Grand Rapids	Prescott, Frederick F.	Lieut.
Grand Rapids	Stover, Maynard B.	Lieut.
Greenville	Dodds, D. W.	Lt. Cmdr.
Grosse Pt. Pk.	Kimball, H. D.	Lt. Cmdr.
Grosse Pt. Woods	Richardson, H. W.	Lieut.
Holland	Steketee, A.	Lt. Cmdr.
Hudsonville	Cossar, G. S., Jr.	Lieut.
Huntington Woods	Shook, W. J.	Lt. Cmdr.
Kalamazoo	Heath, Frank A.	Lieut.
Kalamazoo	Short, John R.	Lieut.
Lowell	Oatley, Douglas H.	Lieut.
Manistee	Johnson, Richard J.	Lieut.
Marquette	Salo, Wilho D.	Lt. Cmdr.
Mt. Pleasant	Northway, E. A.	Lieut.
Nicollet	Anderson, M. C.	Lt. Cmdr.
Owosso	Krapohl, F. A.	Lt. Cmdr.
Saugatuck	Furst, Harold D.	Lieut.
Traverse City	Laubach, Samuel J.	Lieut.
Traverse City	Lynch, Philip R.	Lieut.
Traverse City	Raftshol, R. W.	Lieut.

Minnesota

Alexandria	Johnson, R. J.	Lt. Cmdr.
Alpha	Echternacht, J. E.	Lieut.
Blue Earth	Baker, Robert H.	Lt. Cmdr.
Bovey	Christenson, Leslie P.	Lieut.
Chaska	Burkhart, C. W.	Lt. Cmdr.
Faribault	Cook, Francis W.	Lt. Cmdr.
Mankato	Riley, Henry E. S.	Lieut.
Minneapolis	Allen, Paul G.	Lieut.
Minneapolis	Bugby, Waldo L.	Lt. Cmdr.
Minneapolis	Campion, Earl S.	Lieut.
Minneapolis	Colby, Henry E.	Lt. Cmdr.
Minneapolis	Courtney, E. W.	Lt. Cmdr.
Minneapolis	Elwood, Carl	Lieut.
Minneapolis	Fossum, K. C.	Lt. Cmdr.
Minneapolis	Larson, A. W.	Lt. Cmdr.
Minneapolis	Nelson, Irving W.	Lieut.
Minneapolis	Nims, Robert V.	Lieut.
Minneapolis	Norvold, R. W.	Lt. Cmdr.
Minneapolis	Porteous, G. C.	Lieut.
Minneapolis	Roberts, John A.	Lt. Cmdr.
Minneapolis	Sheldon, P. W.	Lieut.
Minneapolis	Taylor, Dale J.	Lt. Cmdr.
Minneapolis	Yock, Douglas H.	Lieut.
Monterey	Carlson, Lowell R.	Lieut.
Morris	Ederer, B. F.	Lt. Cmdr.
Morris	Jorgenson, H. W.	Lieut.
Olivia	Petricka, Victor A.	Lieut.
Red Wing	Siemer, H. N.	Lt. Cmdr.
St. Louis Park	Tossy, Chester V.	Lieut.
St. Paul	Hartwick, W. L.	Lieut.
St. Paul	Lewis, Wendell P.	Lieut.
St. Paul	Mackay, D. R.	Lt. Cmdr.
St. Paul	Messing, Richard F.	Lieut.
St. Paul	Starjash, Dan P.	Lieut.
Staples	Mraz, William J.	Lieut.
Thief River Falls	Hanson, Warren J.	Lieut.
Thief River Falls	Laberee, Edwin J.	Lieut.
Two Harbors	Sande, John P., Jr.	Lieut.
Tyler	Utoft, Ivan	Lieut.
Virginia	Thomas, Robert J.	Lieut.

Mississippi

Bay St. Louis	Ramsey, B. L.	Lt. Cmdr.
Clarksdale	Miller, William E.	Lieut.
Pass Christian	Syx, Bernard C.	Lieut.

Missouri

Ava	Curry, Howard J.	Lieut.
Belton	Denney, Frank C.	Lt. Cmdr.
Cole Camp	Riemenschnitter, O. U.	Lieut.
Fulton	Prada, John W.	Lieut.
Independence	Hildreth, J. W.	Lieut.
Kansas City	Edmondson, John, Jr.	Lieut.
Kansas City	Kirschbaum, George	Lieut.
Kansas City	McGregor, D. B.	Lt. Cmdr.
Kansas City	Sherwood, Edwin M.	Lieut.
Kirksville	Korns, Richard D.	Lieut.
Larussel	Gillock, Robert D.	Lieut.
Lee's Summit	Matthews, Carl S.	Lieut.
Normandy	Eckardt, Paul P.	Lieut.
Rolla	Vessell, James H.	Lieut.
St. Louis	Elder, Edward F.	Lieut.
St. Louis	Hanser, Otto C. R.	Lieut.
St. Louis	Koeberlin, Erwin W.	Lieut.
St. Louis	Kuntz, Herbert A.	Lieut.
St. Louis	Life, Jesse H.	Lieut.
St. Louis	Lipton, Silbert	Lt. Cmdr.
St. Louis	Moeller, F. G.	Lt. Cmdr.
St. Louis	Vierheller, P. G., Jr.	Lieut.
St. Louis	Voyles, John S.	Lt. Cmdr.
St. Louis	Wagman, Elmer	Lieut.
St. Louis	Westerfield, K. W. R.	Lieut.
St. Louis	Wunderlich, H. J.	Lt. Cmdr.
Sedalia	Abney, George H.	Lt. Cmdr.
Springfield	Reynolds, James O.	Lieut.
Thayer	Ellis, Claude H.	Lt. Cmdr.
University City	Seibert, Rudolph C.	Lieut.
Webster Groves	McGee, William E.	Lieut.
Webster Groves	Roberts, Ralph L.	Lieut.

Nebraska

Hastings	Micek, L. S.	Lt. Cmdr.
Hastings	Leeper, Hubert J.	Lieut.
Lincoln	Roemmich, R. E.	Lt. Cmdr.
Lincoln	Rotton, William I.	Lieut.
Lincoln	Timmons, Nolan D.	Lieut.
Omaha	Fridley, Harry H.	Lt. Cmdr.
Omaha	Graves, C. H.	Lt. Cmdr.
Omaha	McAleer, Joseph W.	Cmdr.
Omaha	Randall, George T.	Lieut.
Omaha	Wohl, Ernest	Lieut.
Scottsbluff	Zahradnicek, H. C.	Lieut.
Seward	Maixner, Fred W.	Lieut.
Spencer	Koenig, Albin J.	Lieut.
Wayne	Perry, Leland F.	Lt. Cmdr.

New Hampshire

Concord	Whittaker, R. T.	Lieut.
Manchester	Glennon, T. A.	Lt. Cmdr.
Manchester	MacRury, E. F.	Lt. Cmdr.
Portsmouth	Farrington, W. M.	Lieut.

New Jersey

Arlington	Martino, James J.	Lieut.
Audubon	Buecker, R. H.	Lt. Cmdr.
Bayonne	Bevan, George R.	Cmdr.
Beach Haven Terrace	Todd, Merwin A., Jr.	Lieut.
Bergenfield	Alexander, M. U.	Lieut.
Bloomfield	Power, A. G. H., Jr.	Lieut.
Boonton	London, Abraham A.	Lieut.
Burlington	Steinruck, J. C., Jr.	Lieut.
Cape May Court House	Bailey, Ralph M.	Lieut.
Clifton	Silver, Malcolm	Lieut.
Cranford	Kelly, W. J.	Lt. Cmdr.
East Orange	Johnston, D. R.	Lt. Cmdr.
Elizabeth	Wayne, Jerome	Lieut.
Garfield	Fusco, Ralph M.	Lieut.
Gloucester	Klotz, Otto G.	Lieut.
Hasbrouck Heights	Bruno, Michael A.	Lieut.
Irvington	Behrendt, Frederick	Cmdr.
Irvington	Braun, Herman	Lt. Cmdr.
Irvington	Golinski, John T.	Lieut.
Irvington	Keil, Harry R.	Lieut.
Jersey City	Westervelt, E. A.	Lt. Cmdr.
Kearny	Ross, Jean D.	Lt. Cmdr.
Maplewood	Mansell, H. C.	Lt. Cmdr.
Montclair	Cunningham, John J.	Lieut.
Montclair	Moore, C. M.	Lt. Cmdr.
Newark	Brotman, A. A.	Lieut.
Newark	Burg, Leonard H.	Lieut.
Newark	Megaro, Frank J.	Lieut.
Newark	Schwartz, C.	Lt. Cmdr.
Orange	DeVincentis, D. V.	Lieut.
Passaic	Canova, Raymond P.	Lieut.
Paterson	Bongiorno, Frank P.	Lieut.
Perth Amboy	Loomar, Morris A.	Lieut.
Phillipsburg	Beam, Herman S.	Lt. Cmdr.
Ridgewood	Haggerty, W. D., Jr.	Lieut.
Rutherford	Hamer, Alfred E.	Lieut.
Somerville	Lee, J. W., Jr.	Lt. Cmdr.
Somerville	Skowronek, Marvin	Lieut.
South Orange	Barnes, Bradley B.	Lieut.
South Orange	Greenlee, C. E., Jr.	Lieut.
Stone Harbor	Miles, Charles T.	Cmdr.
Trenton	Powell, Julius B.	Lieut.
Trenton	Roitman, Irvin	Lieut.
Upper Montclair	Marion, Howard D.	Lieut.
Westville	Taylor, John R.	Lt. Cmdr.

New York

Ardsley	Seitz, Paul A.	Lieut.
Arverne	Ruden, Irving	Lieut.
Auburn	Izzo, Samuel J.	Lt. Cmdr.
Auburn	Rose, Jack J.	Lt. Cmdr.
Auburn	Schwartz, J. M.	Lt. Cmdr.
Babylon	Killey, George W.	Lieut.
Briarcliff Manor	Foley, Frank A.	Lt. Cmdr.
Bronx	Levy, Bernard	Lieut.
Bronx	Peck, Nathan	Lieut.
Bronx	Rasumoff, Herbert	Lieut.
Bronxville	Lancaster, W. M.	Lieut.
Brooklyn	Arvins, Allan N.	Lieut.
Brooklyn	Barattini, John A.	Lieut.
Brooklyn	Berman, William	Lieut.
Brooklyn	Doehling, Martin L.	Lieut.
Brooklyn	Greene, Harry H.	Lieut.
Brooklyn	Hall, Murray J.	Lieut.
Brooklyn	Kant, Robert G.	Lieut.
Brooklyn	Kaye, Saul	Lt. Cmdr.
Brooklyn	London, George J.	Lieut.
Brooklyn	McCloskey, C. J.	Lieut.
Brooklyn	Meadow, Arthur	Lieut.
Brooklyn	Nadel, Alfred	Lieut.
Brooklyn	Needham, John J.	Lt. Cmdr.
Brooklyn	Protzel, Martin R.	Lieut.
Brooklyn	Rosanelli, Gabriel D.	Lieut.
Brooklyn	Stoller, Sidney E.	Lieut.
Buffalo	Fahey, Thomas J.	Lieut.
Buffalo	Haid, Harold G.	Lt. Cmdr.

Canisteo	Vincent, Harry B.	Lt. Cmdr.
Cornwall	Brown, David S.	Lieut.
Ellenville	Weitz, Fred	Lieut.
Elmhurst	Forman, M. H.	Lt. Cmdr.
Endicott	Watts, Jesse G.	Lieut.
Flushing	Murray, V. J.	Lt. Cmdr.
Forest Hills	Psaki, Frederick J.	Lieut.
Glens Falls	Higgins, Ernest C.	Lieut.
Grymes Hill	Ivory, James J.	Cmdr.
Hempstead	Andrews, John N.	Lt. Cmdr.
Hewlett	Spiegel, Edward J.	Lieut.
Highland Park	Stackhouse, J. A., Jr.	Lieut.
Jamaica	Murphy, John G.	Lieut.
Jamestown	Phillips, Oliver H.	Lieut.
Johnson City	O'Hara, Edward M.	Lieut.
Kenmore	Greek, Milo F.	Lieut.
Kingston	Van Gaasbeck, Judson B.	Lt. Cmdr.
Larchmont	Malarick, W. S.	Lt. Cmdr.
LeRoy	O'Mealia, T. K.	Lt. Cmdr.
Mechanicville	Cavotta, Michael R.	Lieut.
Mineola	Giuliano, Michael L.	Lieut.
Mt. Vernon	Castaldi, Frank D.	Lieut.
Mt. Vernon	Pepper, Albert J.	Lieut.
Mt. Vernon	Sloan, Edward J.	Lieut.
Nanuet	Grosch, Carl, Jr.	Lieut.
New York	Auerbach, B. B.	Lt. Cmdr.
New York	Brown, Paul R.	Lieut.
New York	Kaufman, M. M.	Lieut.
New York	Linett, M. H.	Lt. Cmdr.
New York	Nash, Seymour L.	Lieut.
New York	Salviolo, Joseph A.	Lieut.
New York	Schumann, W. E.	Lieut.
New York	Traugott, J. P., Jr.	Lt Cmdr.
New York	Weinstein, Morris S.	Lieut.
North Tarrytown	Donaldson, F. L.	Lt. Cmdr.
North Tarrytown	Simons, Samuel I.	Lieut.
No. Tonawanda	Rosinski, Alfons J.	Lieut.
Ozone Park	Rook, Albert	Lt. Cmdr.
Plattsburg	Boule, Roger I.	Lieut.
Queens Village	Schoman, Kenneth E.	Lieut.
Richmond Hill	Sommer, J. C.	Lt. Cmdr.
Riverhead	Menendez, Francis E.	Lieut.
Rochester	Agnew, Frederick L.	Lieut.
Rochester	Gianforti, F. J.	Lt. Cmdr.
Rochester	Pierce, Wilbur F., Jr.	Lieut.
Rochester	Sayler, Jenner P.	Lieut.
Rochester	Spahn, Philip F.	Lieut.
Rochester	Towers, P. A.	Lt. Cmdr.
Rockaway Beach	Laub, Benjamin	Lt. Cmdr.
Rockville Centre	Desnoes, Alfred D.	Lieut.
Rockville Centre	Rendich, Henry J., Jr.	Lieut.
Rockville Centre	Rowbottom, J. T.	Lieut.
Schenectady	Feuer, Samuel S.	Lt. Cmdr.
Seneca Falls	Reeder, Raymond K.	Lieut.
Syracuse	Sweeney, Harry T. R.	Lieut.
Tuckahoe	Gage, S. A., Jr.	Lt. Cmdr.
Walden	Keck, Alfred J.	Lt. Cmdr.
Yonkers	Burr, John D.	Lt. Cmdr.
Yonkers	Shesler, L. F., Jr.	Lieut.
Yonkers	Teitelbaum, G. H.	Lieut.

North Carolina

Charlotte	Motley, E. R., Jr.	Cmdr.
Charlotte	Sholar, N. P.	Lt. Cmdr.
Concord	Davis, J. V., Jr.	Lieut.
Elon College	Johnston, Charles D., Jr.	Lt. Cmdr.
Madison	Webster, Frank T.	Lieut.
Mt. Airy	Conduff, Duke P.	Lieut.
Raleigh	Swindell, J. E.	Lt. Cmdr.
Winston-Salem	Roush, Harry	Lt. Cmdr.

North Dakota

Bismarck	McGuiness, J. W., Jr.	Lieut.
Bottineau	Juneau, Ralph A. E.	Lieut.

Ohio

Akron	Hatch, Charles W.	Lieut.
Akron	McCormish, V. E.	Lt. Cmdr.
Akron	Stinaff, Robert K.	Lt. Cmdr.
Ashland	Mehl, Robert T.	Lieut.
Barberton	Wearstler, David O.	Lieut.
Barnesville	Phillips, Edward P.	Lieut.
Belpre	Simpson, John A.	Lieut.
Cambridge	Secrest, R. H.	Lt. Cmdr.
Canton	Wolf, Wayne S.	Lieut.
Chillicothe	Uhrig, Frank G., Jr.	Lieut.
Cincinnati	Dunlop, James D.	Lt. Cmdr.
Cincinnati	Greenberg, H. I.	Lt. Cmdr.
Cincinnati	Holle, Robert L.	Lieut.
Cincinnati	Routt, Dillon M.	Lieut.
Cincinnati	Schmalz, Lester O.	Lieut.
Cleveland	Hruby, Elmer J.	Lieut.
Cleveland	Kohl, Charles B.	Lt. Cmdr.
Cleveland	Liotta, Frank C.	Lt. Cmdr.
Cleveland	Prucha, John F.	Lieut.
Cleveland	Rygalski, Edward	Lieut.
Cleveland	Soucek, Frank A.	Lieut.
Cleveland	Spronz, Anthony J.	Lieut.
Cleveland	Zaworski, Edmund R.	Lieut.
Cleveland Hts.	Cooperman, L. L.	Lt. Cmdr.
Cleveland Hts.	Miller, Sidney	Lieut.
Cleveland Hts.	Spira, Alvin R.	Lieut.
Columbus	Monett, H. L.	Lt. Cmdr.
Columbus	Rupp, Nelson W.	Lieut.
Cuyahoga Falls	Roehner, L. O.	Lt. Cmdr.
Dayton	Jordan, Charles A.	Lieut.
Dover	Ley, Robert E., Jr.	Lieut.
East Cleveland	Evans, Wayne A.	Lt. Cmdr.
Ironton	Murray, Hugh L.	Lieut.
Ironton	Wileman, George M.	Lieut.
Lakewood	Graebner, Paul D.	Lieut.
Massillon	Jerman, Albert D.	Lieut.
Mentor	Stephens, D. W.	Lt. Cmdr.
Millsfield	Patton, Woodrow W.	Lieut.
Mt. Vernon	Mayer, Joseph, Jr.	Lieut.
Newark	Roush, Sigel G.	Lieut.
Newton Falls	Hurd, Robert L.	Lieut.
Salem	Lease, Donald E.	Lieut.
Shaker Heights	Gray, Sanford L.	Lieut.
Springfield	Baldwin, John W.	Lt. Cmdr.
Springfield	Kirk, Robert T.	Lieut.
Toledo	Black, George D.	Lieut.
Toledo	Myers, Paul R.	Lieut.
Toledo	Rimer, Robert E.	Lieut.
Troy	Cockerill, Joseph E.	Lieut.
University Hts.	Adelstein, Herman	Lieut.
Van Wert	Laing, Bruce O.	Lieut.
Vista	Carpenter, H. L.	Lt. Cmdr.
Wapakoneta	Hardacre, Riley L.	Lieut.
Warren	Wargelin, Arno I.	Lt. Cmdr.
Westlake	Williams, George A.	Lieut.
Youngstown	Shuckhart, Vernon E.	Lieut.

Oklahoma

Ada	Granger, D. C.	Lt. Cmdr.

Bixby	Mose, John D.	Lieut.
Leflore	Booth, Thomas G.	Lieut.
Oklahoma City	Taubman, M. S.	Lt. Cmdr.
Ponca City	Whitman, Paul S.	Lieut.
Stigler	Bell, Gerald E.	Lieut.
Temple	Gossett, James W.	Lieut.
	Oregon	
Ashland	Woods, C. A.	Lieut.
Portland	Dinham, William R., Jr.	Lt. Cmdr.
Portland	Smith, Wilford M.	Lieut.
Salem	Burrell, W. H.	Lieut.
The Dalles	Fisher, K. C.	Lt. Cmdr.
	Pennsylvania	
Alden	Kates, Elvin R., Jr.	Lieut.
Allentown	Miller, Charles A.	Lieut.
Bethlehem	Lang, William F. A.	Lieut.
Bradford	Garin, Thomas B.	Lt. Cmdr.
Bradford	Johnson, Andrew, Jr.	Lieut.
Brownsville	Mulligan, Robert A.	Lieut.
Butler	McCandless, H. A., Jr.	Lieut.
Carlisle	Fletcher, John C.	Lt. Cmdr.
Catasauqua	Beitel, Harry S.	Lieut.
Charleroi	Sphar, R. L.	Lt. Cmdr.
Coraopolis	Anderson, R. T.	Lieut.
Coraopolis	Thompson, Robert V.	Lieut.
Downingtown	Snyder, Joseph M.	Lieut.
Dravosburg	Glenn, William S.	Lieut.
Dravosburg	Pointer, Norvil T.	Lieut.
East Brady	Miller, Harvey B.	Lt. Cmdr.
Erie	Davis, Kenneth L.	Lieut.
Forty Fort	Gromel, G. H.	Lt. Cmdr.
Fredericktown	Bell, Robert W.	Lieut.
Greensburg	Larue, John R.	Lieut.
Hazleton	Peters, H. E.	Lt. Cmdr.
Latrobe	Kelly, Jack J.	Lt. Cmdr.
Merion Station	Benson, Arthur C.	Lieut.
Merion Station	Meinfelder, E. L.	Lieut.
Midland	Benedict, Frank J.	Lieut.
Montgomery County	DeMarco, Joseph A.	Lieut.
Montgomery County	Grubb, David G., Jr.	Lieut.
Munhall	Cook, Thomas L.	Lieut.
New Castle	Reynolds, Amzie G.	Lieut.
New Milford	Valentine, Francis J.	Lieut.
Newtown	Hennessy, R. V.	Lt. Cmdr.
Oakmont	Stoner, George M.	Lieut.
Philadelphia	Brown, Jacob	Lieut.
Philadelphia	Cohn, Herbert S.	Lt. Cmdr.
Philadelphia	Collins, J. R. A.	Lt. Cmdr.
Philadelphia	Krauser, Milton	Lieut.
Philadelphia	LaRocca, Rocco L.	Lieut.
Philadelphia	Leberman, O. F.	Lt. Cmdr.
Philadelphia	Mortimer, G. J., Jr.	Lieut.
Philadelphia	Reid, Paul V.	Lieut.
Philadelphia	Rowen, Robert, Jr.	Lieut.
Philadelphia	Zitin, Samuel I.	Lieut.
Pittsburgh	Baker, Edward B.	Lieut.
Pittsburgh	Boucek, George P.	Lieut.
Pittsburgh	Brodbeck, Joseph M.	Lieut.
Pittsburgh	Choby, A. R.	Lt. Cmdr.
Pittsburgh	DeWaters, Robert S.	Capt.
Pittsburgh	Fischer, Frank W.	Lieut.
Pittsburgh	Freyvogel, Paul T.	Lieut.
Pittsburgh	George, William A.	Lieut.
Pittsburgh	Gordon, Herman	Lt. Cmdr.
Pittsburgh	Gurczenski, A. A.	Lieut.
Pittsburgh	Howard, Harry D.	Lieut.
Pittsburgh	Konick, Abe	Lt. Cmdr.
Pittsburgh	Moke, George R.	Lt. Cmdr.
Pittsburgh	Schnabel, John S.	Lieut.
Pittsburgh	Smith, Donald H.	Lieut.
Pittsburgh	Solomon, Bernard	Lieut.
Pittsburgh	Weber, Robert G.	Lieut.
Pittsburgh	Weiss, Samuel R.	Lieut.
Pittsburgh	Wunderly, J. S.	Lt. Cmdr.
Pottstown	Smith, Samuel C.	Lt. Cmdr.
Pottstown	Tagert, Joseph E.	Lieut.
Pottsville	Curran, Hugh J.	Lt. Cmdr.
Quarryville	Steele, John W.	Lieut.
Roaring Spring	Wertz, David D.	Lieut.
Rosslyn Farms	Haudenshield, G. K.	Lieut.
St. Johns	Sheese, Frederick G.	Lieut.
Scranton	Kulczycki, George	Lieut.
Sharon	Hoban, Walter P.	Lieut.
Stoneboro	Thomas, Philip C.	Lieut.
Sunbury	Bergstresser, E. L.	Lieut.
Uniontown	Nabors, Altha B.	Lt. Comdr.
Uniontown	Nabors, William A.	Lieut.
Upper Darby	Rode, Harry M.	Cmdr.
West Chester	Lawrence, Edgar R.	Lieut.
West Pittston	Turnbach, Robert J.	Lieut.
Williamsport	Yoder, James H.	Lieut.
Yeadon	Myers, John H.	Lieut.
Yeadon	Spalding, G. W. T.	Lieut.
York	Spangler, Robert F.	Lieut.
York	Welsh, John H.	Lieut.
	Rhode Island	
Bradford	Capalbo, Pasquale E.	Lieut.
East Greenwich	Truhan, E. L.	Lt. Cmdr.
Pawtucket	Clarke, E. M., Jr.	Lieut.
Providence	Carlson, Adolph B.	Lieut.
Providence	Johnston, Robert R.	Lieut.
Providence	Jordan, Charles E.	Lieut.
Providence	Kanelos, Peter T.	Lt. Cmdr.
Providence	Liguori, Sirio L.	Lieut.
Providence	Lindemann, R. E.	Lieut.
	South Carolina	
Charleston	Karesh, Irwin	Lt. Cmdr.
Chester	Ehrlich, M. J., Jr.	Lieut.
Columbia	Draffin, Francis M.	Lieut.
Timmonsville	Lawhon, Clyde A.	Lieut.
	South Dakota	
Aberdeen	Kelly, Charles B.	Lt. Cmdr.
Elkton	Dunn, William E.	Lieut.
Huron	Fossum, A. B.	Lt. Cmdr.
Tyndall	Serr, Hubert H.	Lieut.
	Tennessee	
Bristol	McIntyre, J. T., Jr.	Lieut.
Chattanooga	Hamilton, Martin R.	Lieut.
Dayton	Morgan, A. M., Jr.	Lieut.
Knoxville	Parker, William A.	Lieut.
Louden	Campbell, William B.	Lieut.
Memphis	Cross, John W.	Cmdr.
Nashville	Elam, Roy O., Jr.	Lieut.
Nashville	Oliver, William H.	Lieut.
Springfield	Johnson, Willard P.	Lieut.
White Pine	Martin, Arthur G.	Lt. Cmdr.

Texas

Abilene	Beaty, Burnice Z.	Lieut.
Austin	Conley, Francis A.	Lieut.
Beaumont	Scheps, Gerson	Lt. Cmdr.
Brownsville	Valentin, E., Jr.	Lieut.
Burton	Althaus, Herbert O.	Lieut.
Cleveland	Diemer, Rodney R.	Lieut.
Corpus Christi	Molbeck, Andrew C.	Cmdr.
Dallas	Polhemus, John G., Jr.	Lieut.
Dallas	Pomarantz, W.	Lt. Cmdr.
El Paso	Fitzgerald, James W.	Lieut.
Fort Worth	Boren, Edgar R., Jr.	Lieut.
Fort Worth	Winston, Jack R., Jr.	Lieut.
Houston	Allen, Eugene M.	Lieut.
Houston	Baer, Robert E.	Lt. Cmdr.
Houston	Cooksey, Edward J.	Lieut.
Houston	Fischer, Jack C.	Lieut.
Houston	Gilliam, Paul E.	Lieut.
Houston	Kopecinski, A. H.	Lieut.
Houston	McClendon, C. H.	Lieut.
Houston	Odom, Willie C.	Lieut.
Houston	Orman, W. M. K.	Lieut.
Houston	Roberts, Leon	Lieut.
Houston	Rogers, Weldon B.	Lieut.
Houston	Roney, Robert C.	Lieut.
Lampasas	Peak, Joe D.	Lt. Cmdr.
Lytle	Gray, O'Neal M.	Lieut.
Marlin	Peacock, A. M., Jr.	Lieut.
Pampa	Hicks, Hardy H.	Lt. Cmdr.
Perryton	Wood, W. M., Jr.	Lieut.
Port Arthur	Wood, James E.	Lieut.
Roscoe	Young, J. W., Jr.	Lt. Cmdr.
Seguin	Sagebiel, Ralph F.	Lieut.
Sugarland	Wheeler, John F.	Lieut.
Tyler	Nasits, B. J.	Lt. Cmdr.
Waxahachie	Stafford, O. E.	Lt. Cmdr.
Willcox	Wilson, John C.	Lt. Cmdr.

Utah

Logan	Smith, Cannon P.	Lieut.
Salt Lake City	Squires, Sidney	Lt. Cmdr.
Salt Lake City	Sweeten, Robert L.	Lieut.
Salt Lake City	Uffens, LeGrand	Lieut.
Tremonton	Woodhead, R. G.	Lt. Cmdr.
Washington	Nisson, Antone W.	Lieut.

Vermont

Bristol	Cardell, William H.	Lieut.
Hyde Park	Foss, Harry C.	Lieut.
Moretown	O'Neill, E. J.	Lieut.
Rutland	Van Santvoord, E. H.	Lieut.

Virginia

Alexandria	Powell, Hume S.	Lt. Cmdr.
Arlington	Higgins, Richard	Lieut.
Arlington	Humphries, John L.	Lieut.
Ashland	Weems, Julius B.	Lt. Cmdr.
Bedford	Handy, Phillip W.	Lt. Cmdr.
Charlottesville	Hutcherson, I. L.	Lt. Cmdr.
Covington	George, George J.	Lieut.
Danville	Stoner, David S.	Lieut.
Fairfax	Alexander, A. D.	Lt. Cmdr.
Formosa	Duffer, Aubrey G.	Lt. Cmdr.
Hampton	Burbank, J. M.	Lt. Cmdr.
Hampton	Fry, Darwin H.	Lieut.
Hilton Village	Willson, P. M.	Lt. Cmdr.
Millwood	Birch, Samuel M.	Lieut.
Norfolk	O'Keefe, John J.	Lieut.
Norfolk	Walker, John L., Jr.	Lieut.
Norton	Baker, Everett W.	Lieut.
Portsmouth	Buxton, S. E., Jr.	Cmdr.
Portsmouth	Parker, James L.	Lieut.
Pulaski	Brockmeyer, M. W.	Lt. Cmdr.
Raccoon Ford	Voneiff, W. H.	Lt. Cmdr.
Roanoke	Willson, P. M.	Lt. Cmdr.
St. Paul	Davis, P. N., Jr.	Lieut.
South Arlington	Miller, Philip	Lt. Cmdr.
Staunton	Armstrong, W. E.	Lt. Cmdr.
Staunton	Callar, Donald E.	Lt. Cmdr.
Stuart	Handy, Ralph W.	Lieut.
Virginia Beach	Clarke, Lonnie O., Jr.	Lieut.
Warrenton	Davila, Jose R.	Lt. Cmdr.

Washington

Bremerton	Henderson, H. B.	Lieut.
Bremerton	Peterson, Richard V.	Lieut.
Colfax	Carey, William A.	Lieut.
Kirkland	West, Robert R.	Lieut.
Longview	Gyllenberg, W. H.	Lt. Cmdr.
Lynden	Fisher, W. A.	Lt. Cmdr.
Renton	Ochs, Jess B.	Lieut.
Renton	Shuler, Elmer C.	Lt. Cmdr.
Seattle	Casey, Donald E.	Lieut.
Seattle	Dohner, Gerald N.	Lieut.
Seattle	Dull, Howard L.	Lieut.
Seattle	Farley, John M.	Lt. Cmdr.
Seattle	Graham, Charles D.	Lieut.
Seattle	Harris, W. H.	Lt. Cmdr.
Seattle	Jenkins, Ralph P.	Lt. Cmdr.
Seattle	Knowlton, R. P.	Lt. Cmdr.
Snohomish	Odegard, H. E.	Lt. Cmdr.
Spokane	Miller, Gilbert H.	Lt. Cmdr.
Spokane	Owens, Lawrence O.	Lieut.
Tacoma	Armstrong, Philip C.	Lieut.
Tacoma	Ford, Kenneth L.	Lieut.
Tacoma	Matthies, Alvin E.	Cmdr.
Tenino	Johnson, Edgar A.	Lieut.

West Virginia

Bluefield	Kell, Anthony	Lieut.
Bluefield	McCue, James D.	Lt. Cmdr.
Charleston	Sines, Francis A.	Lt. Cmdr.
Elkins	Klow, Milton	Lieut.
Elkins	Shreve, James W.	Lieut.
Fairmont	Hawkins, Donald C.	Lieut.
Fairmont	Sowers, Scott	Lieut.
Grafton	Flanagan, James V.	Lieut.
Keyser	Eagle, James W.	Lt. Cmdr.
Kingwood	Gibson, Harry R.	Lieut.
Logan	Curry, Roy C.	Lt. Cmdr.
Romney	Easton, J. F., Jr.	Lt. Cmdr.
Shinnston	Mazzei, J. W.	Lt. Cmdr.
Weston	Wojcihovski, L. J.	Lt. Cmdr.
Wheeling	Armbrecht, E. C.	Lt. Cmdr.

Wisconsin

Antigo	Brown, Donald R.	Lieut.
Antigo	Stewart, Donald A.	Lieut.
Appleton	Stillman, John C.	Lt. Cmdr.
Appleton	Zussman, I. J.	Lt. Cmdr.
Barron	DeMille, Frederick E.	Lieut.
Beaver Dam	Schoenwetter, R. B.	Lieut.
Beloit	Larson, Mark S.	Lieut.
Berlin	Bush, Burt A.	Lt. Cmdr.
Chippewa Falls	Cardinal, Stanley J.	Lieut.

Cornell	Sparkes, Lloyd E.	Lt. Cmdr.
Eau Claire	Bonner, John P.	Lieut.
Eau Claire	Boortz, Lloyd T.	Lieut.
Eau Claire	Estes, Nathan A., Jr.	Lieut.
Fond du Lac	Keenan, Donald J.	Lieut.
Hales Corners	Bowersock, W. J.	Lieut.
Kenosha	Clark, Wayne J.	Lt. Cmdr.
Kenosha	Heller, Robert L.	Lieut.
La Crosse	Messinger, F. A.	Lieut.
Lancaster	Becker, Reginald J.	Lieut.
Luxemburg	Dewane, Emmet J.	Lieut.
Madison	Hoffman, H. J.	Lt. Cmdr.
Madison	Johnson, Norman C.	Lieut.
Marinette	Nelson, Leslie E.	Lieut.
Medford	Mechelke, C. L.	Lt. Cmdr.
Middleton	Thielke, Charles W.	Lieut.
Milwaukee	Bittman, Walter J.	Lieut.
Milwaukee	Brostek, Arthur S.	Lieut.
Milwaukee	Bull, Francis A.	Lt. Cmdr.
Milwaukee	Capizzi, Joseph L.	Lieut.
Milwaukee	Coburn, Frederick H.	Lieut.
Milwaukee	Darling, John W.	Lieut.
Milwaukee	Doering, Andrew A.	Lieut.
Milwaukee	Evans, Gervais L.	Lt.Cmdr.
Milwaukee	Gehl, Andrew P.	Lieut.
Milwaukee	Harder, Milford E.	Lieut.
Milwaukee	Hinkamp, H. J.	Lt. Cmdr.
Milwaukee	Hoffman, Joseph E.	Lieut.
Milwaukee	Maney, Adrian J.	Lt. Cmdr.
Milwaukee	Patraw, Raymond A.	Lieut.
Milwaukee	Pinter, Elmer C.	Lieut.
Milwaukee	Siewert, G. D., Jr.	Lieut.
Milwaukee	Sufferling, W. H.	Lieut.
Milwaukee	Thanos, John A.	Lieut.
Milwaukee	Tobiason, Roy O.	Lieut.
Milwaukee	Wisniewski, E. G.	Lt. Cmdr.
Neenah	Schultz, William E.	Lieut.
Oshkosh	Bitter, Harold E.	Lieut.
Oshkosh	Kronzer, V. F.	Lt. Cmdr.
Oshkosh	Plotz, Erwin H. H.	Lieut.
Plymouth	Harder, Wilbur J.	Lt. Cmdr.
Portage	Royce, Wilbur F.	Lt. Cmdr.
Port Washington	Leahy, Paul F.	Lt. Cmdr.
Princeton	Priske, Lester J.	Lieut.
Racine	Hanson, H. J.	Lt. Cmdr.
Rhinelander	Metternich, J. C.	Lieut.
Sheboygan	Douglas, Jerome W.	Lieut.
Sheboygan	Knauf, Frederick A.	Lieut.
Stevens Point	Jensen, Winfred A.	Lieut.
Watertown	Craine, Donald R.	Lieut.
Waukesha	Schafer, Dolp S.	Lt. Cmdr.
Waupaca	Remmel, W. H.	Lt. Cmdr.
Wisconsin Rapids	Bandelin, Carl R.	Lieut.

Wyoming

Cheyenne	Appel, Peter W.	Lieut.
Cheyenne	Miller, Arthur L.	Lt. Cmdr.
Green River	Stapleton, Roy J.	Lt. Cmdr.
Laramie	Stebner, Charles M.	Lieut.
Powell	Thompson, H. O.	Lieut.

Cmdr. Warren V. Hanson, of Indianapolis, Ind., has returned to active duty.

LIST OF ARMY DENTAL OFFICERS SEPARATED FROM SERVICE

The following Army dental officers have been separated from service, according to lists received from the Dental Division, Office of the Surgeon General, U. S. Army. These lists are not complete. Publication will be given to other names as soon as possible.

Alabama

Auburn	Hart, Kirby L.	Lieut.
Gadsden	Cooper, Leo K.	Capt.
Birmingham	Cooper, E. B.	Capt.
Birmingham	Kirk, Jesse K.	Lt. Col.
Fairfield	Smith, Ben H., Jr.	Capt.
Ft. Payne	Dawson, Charles P.	Maj.
Heflin	Meacham, Clifford T.	Maj.
Montgomery	Key, James L.	Lt. Col.
Mt. Vernon	Grayson, William O.	Capt.
Thomasville	Jackson, Elo B., Jr.	Lieut.

Alaska

Anchorage	Livie, Robert D.	Capt.

Arizona

Phoenix	Tweed, William M.	Capt.
Prescott	Ferguson, Charles N.	Capt.

Arkansas

Arkadelphia	Hardage, Paul M.	Capt.
Berryville	Gregson, Jack O.	Capt.
Fort Smith	McKennon, P. D., Jr.	Capt.
Greenwood	Ware, Prentiss E.	Capt.
Hot Springs	Phipps, Harold H., Jr.	Capt.
Judsonia	Gill, Bernice E.	Capt.

California

Alhambra	Boller, Edward P.	Capt.
Balboa Island	Brockett, Dale E.	Capt.
Berkeley	McPherson, Hiram A.	Capt.
Fortuna	Clapp, Roger D.	Capt.
Fresno	Dick, William B.	Capt.
Fresno	Shirley, Charles E.	Capt.
Glendale	Zemke, John W.	Capt.
Grass Valley	Dettner, Robert W.	Lt. Col.
Hollywood	Goodley, William V.	Capt.
Hollywood	Saylin, Ralph R.	Capt.
Inglewood	Bryan, Halden J.	Capt.
La Crescenta	Phillips, Richard J.	Capt.
Lodi	Burson, Floyd W.	Capt.
Long Beach	McIntire, Ernest W.	Capt.
Los Angeles	Bilkiss, Jack A.	Capt.
Los Angeles	Binford, Harry D.	Capt.
Los Angeles	Browne, Irving J.	Capt.
Los Angeles	Chamberlin, R.	Capt.
Los Angeles	Dewey, Arthur R.	Maj.

Los Angeles	Ferte, John G., Jr.	Capt.
Los Angeles	Firman, Sol S.	Capt.
Los Angeles	Freeman, Morris J.	Capt.
Los Angeles	Goldberg, Irving J.	Capt.
Los Angeles	Greaser, Arthur D.	Capt.
Los Angeles	Kavoian, Karnig K.	Capt.
Los Angeles	Lee, Alfred E.	Capt.
Los Angeles	Ridcley, Paul	Capt.
Los Angeles	Roberts, William D.	Capt.
Los Angeles	Robinson, Cato G.	Capt.
Los Angeles	Saks, Morris H.	Capt.
Los Angeles	Sayers, Charles E.	Capt.
Los Angeles	Shields, Bernard J.	Maj.
Macteca	Valentine, George E.	Maj.
Oakland	Finch, Lowell C.	Capt.
Oakland	Johnson, Richard S.	Maj.
Oakland	Sherman, Melvin J.	Capt.
Pasadena	Beskin, Louis G.	Capt.
Pasadena	Blake, Samuel R.	Capt.
Porterville	Carpenter, Byron L.	Maj.
Riverside	Pool, Richard B.	Lt. Col.
Sacramento	Dufour, Kenneth I.	Capt.
Sacramento	Tackney, John I.	Lt. Col.
San Bernardino	Pinckert, Warren E.	Capt.
San Bernardino	Subject, Henry S.	Capt.
San Francisco	Brady, Herbert H.	Capt.
San Francisco	Compton, Elmer S.	Maj.
San Francisco	Cuthbertson, W. L.	Capt.
San Francisco	Ferber, Erwin W.	Lt. Col.
San Francisco	Garabedian, Henry C.	Capt.
San Francisco	Hart, Winthrop F.	Maj.
San Francisco	Hewlett, Edward	Capt.
San Francisco	Lee, Albert S.	Capt.
San Francisco	Lonergan, J. H.	Capt.
San Francisco	Miller, Henley E.	Lt. Col.
San Francisco	Roseberry, R. L.	Lt. Col.
San Francisco	Schmitz, John L.	Maj.
San Francisco	Segal, Eldred M.	Capt.
San Francisco	Stuart, Herbert J.	Maj.
San Jose	Brownton, L. P.	Capt.
San Jose	Brownton, William F.	Capt.
San Jose	Short, Frank E.	Capt.
San Luis Obispo	Johnson, James R.	Capt.
San Pedro	Richardson, Louis P.	Maj.
San Pedro	Sher, Herman A.	Capt.
Santa Monica	Kaplan, Julius L.	Capt.
Whittier	Daniels, Howard E.	Capt.
	Colorado	
Berthoud	Fickel, Robert B.	Capt.
Boulder	Royce, James D.	Capt.
Canon City	Howe, Newton E.	Capt.
Colorado Springs	Shaw, Oren Vern	Lt. Col.
Denver	Berry, Warren A.	Capt.
Denver	Cody, William E.	Capt.
Denver	Collins, Peter P.	Capt.
Denver	Garrison, Franklin S.	Capt.
Denver	Lyon, Donald F., Jr.	Capt.
Denver	Scott, Andrew P.	Capt.
Englewood	DeHart, L. M.	Maj.
Loveland	Hogge, Donald W.	Capt.
Rifle	Blakeley, Alderson A.	Capt.
Salida	Fuller, Francis L.	Capt.
	Connecticut	
Barnford	Falk, Wilbur N.	Maj.
Bridgeport	Bell, Sidney M.	Capt.
Bridgeport	Coviello, Philip A.	Lieut.
Bridgeport	Unger, Harold P.	Capt.
Clintonville	Dunleavy, William R.	Maj.
Derby	Klubek, Victor J.	Capt.
Hartford	Sucoll, Sidney	Capt.
Middletown	Palmer, Lawrence S.	Capt.
Naugatuck	Lerman, Edward M.	Capt.
New Britain	D'Amato, Coredo J.	Capt.
New Britain	Rabinowitz, S. A.	Capt.
New Canaan	Groher, David L.	Capt.
New Haven	Barnett, Arthur	Lieut.
New Haven	Eustace, Edward B.	Capt.
New Haven	Faulkner, Newton E.	Capt.
New Haven	Frank, Samuel M.	Capt.
New Haven	Gillespie, R. W.	Capt.
New Haven	Hines, Sidney L.	Capt.
New Haven	Rosenfield, William A.	Capt.
New Haven	Scarbrough, M. M.	Capt.
New London	Bradshaw, Donald F.	Capt.
Shelton	Gaynor, William P.	Capt.
Stamford	Neuger, Andrew	Lieut.
Union City	Chorozak, John J.	Lieut.
Wallingford	Kovacs, Andrew F.	Capt.
Waterbury	Daniels, F. C.	Lt. Col.
West Hartford	Ruder, Louis P.	Capt.
Willimantic	Lilliendahl, J. R., Jr.	Capt.
	Delaware	
Dover	Zurkow, George A.	Maj.
Wilmington	Leary, Edgar T.	Capt.
	District of Columbia	
Washington	Alexander, William L.	Capt.
Washington	Faw, Joseph N.	Capt.
Washington	Friedman, Jack	Capt.
Washington	Judge, John A.	Capt.
Washington	Mallinoff, Herman	Capt.
	Florida	
Chattahoochee	Shearouse, W. A.	Maj.
Coral Gables	Gordon, Sidney Hill	Maj.
Jacksonville	Oetjen, John H., Jr.	Capt.
Lake Wales	Howze, James L.	Capt.
St. Petersburg	Forbes, Benjamin C.	Capt.
Tallahasse	Ott, William J., Jr.	Capt.
Tampa	Garcia, Woodrow W.	Capt.
	Georgia	
Atlanta	Funkhouser, W. L.	Maj.
Atlanta	Wender, Ramon F.	Capt.
Macon	Freedman, Morris	Capt.
Summerville	Shumate, John H., Jr.	Capt.
Toccoa	Pilgrim, Amos O.	Maj.
Valdosta	Holtzendorff, L. C.	Maj.
	Idaho	
Meridian	Ogilvie, George R.	Lieut.
Montpelier	Barkdull, Stewart	Maj.
Moscow	Fry, Arthur E.	Capt.
South Nampa	Perry, Edmond M.	Lt. Col.
	Illinois	
Aurora	Keiser, Paul E.	Capt.
Belleville	Beske, Arthur H.	Capt.
Belleville	McKain, John T.	Capt.
Belvidere	Schroeder, Norman J.	Capt.
Berwyn	Grassle, Ralph M.	Maj.
Bloomington	Moore, Thomas J.	Maj.
Bloomington	Ten Eyck, Lynn H.	Capt.

Carrollton	Clough, Richard D.	Capt.
Centerville St'n	Forestner, Harvey J.	Capt.
Chicago	Adler, Leo S.	Capt.
Chicago	Agster, William C.	Lt. Col.
Chicago	Alson, Axel R.	Capt.
Chicago	Anderson, Victor E.	Capt.
Chicago	Balin, Norman	Capt.
Chicago	Belofsky, Armand	Capt.
Chicago	Benson, Edward O.	Capt.
Chicago	Boehler, Carl B.	Capt.
Chicago	Clavecilla, F. P.	Lieut.
Chicago	Davis, Walter K.	Capt.
Chicago	Fishman, Theodore	Capt.
Chicago	Flaxman, George D.	Capt.
Chicago	Franklin, Edward M.	Capt.
Chicago	Frey, Clemens N.	Lieut.
Chicago	Galaskiewicz, S. F.	Lieut.
Chicago	Geffert, Alvin D.	Maj.
Chicago	Gelman, William C.	Capt.
Chicago	Goldberg, Philip T.	Capt.
Chicago	Goldstein, Byron M.	Capt.
Chicago	Gordon, Joseph W.	Capt.
Chicago	Gordon, Wilbert	Capt.
Chicago	Gutmann, Edward N.	Capt.
Chicago	Harris, Stanley M.	Capt.
Chicago	Hayes, Michael J.	Capt.
Chicago	Hirschenbein, I. M.	Capt.
Chicago	Hollander, Walter M.	Capt.
Chicago	Jason, Alfred P.	Capt.
Chicago	Jirka, Arthur I.	Capt.
Chicago	Karch, Francis L.	Capt.
Chicago	Kazen, Harry H.	Capt.
Chicago	Koons, Crandall I.	Maj.
Chicago	Krynicki, Joseph F.	Capt.
Chicago	Kurti, Bert	Capt.
Chicago	Lambert, Roy J.	Capt.
Chicago	Lang, Paul S.	Capt.
Chicago	Lee, Raymond L.	Capt.
Chicago	Lukaszewski, W. C.	Capt.
Chicago	Lynn, Chester F.	Capt.
Chicago	McDonald, Edward J.	Capt.
Chicago	McGough, James W.	Capt.
Chicago	Madda, Vincent A.	Lt. Col.
Chicago	Madonia, Anthony V.	Capt.
Chicago	Melcher, Erwin R.	Capt.
Chicago	Miller, Ray M.	Capt.
Chicago	Mosley, George W.	Capt.
Chicago	Natonson, Milton S.	Capt.
Chicago	Orsinger, R. G.	Capt.
Chicago	Peszynski, Aloysius C.	Lieut.
Chicago	Petraitis, Robert B.	Capt.
Chicago	Rooney, John E.	Lieut.
Chicago	Rosen, Jack	Capt.
Chicago	Saposnik, Joseph I.	Capt.
Chicago	Scher, Robert M.	Capt.
Chicago	Skinner, John W.	Lieut.
Chicago	Spooner, Bruce A.	Capt.
Chicago	Stoppel, William J.	Maj.
Chicago	Sukala, Henry J.	Capt.
Chicago	Van Note, LeRoy J.	Maj.
Chicago	Wadas, Alfred J.	Capt.
Chicago	Walden, Glen M.	Capt.
Chicago	Weintraub, Harry L.	Capt.
Cicero	Rybacek, James J.	Capt.
Decatur	Waggoner, P. H.	Lt. Col.
Dupo	Rose, Edward F.	Capt.
Fairfield	Dale, Edwin E.	Capt.
Freeport	Donahue, Joseph A.	Capt.
Glen Ellyn	Coebergh, M. J.	Capt.
Harrisburg	Funkhouser, B. G.	Capt.
Harrisburg	Seten, Charles E., Jr.	Capt.
Havana	Abrams, Melvin L.	Capt.
Hoopeston	Heaton, Herbert F.	Capt.
Joliet	Benson, Richard C.	Capt.
Joliet	Eckman, Axel C.	Capt.
Joliet	Glenn, Herbert H.	Capt.
Kankakee	Larson, Robert A.	Maj.
Maywood	Linkon, Jack J.	Capt.
Maywood	Soffel, Quintin I.	Maj.
Mt. Pulaski	Hamm, Robert N.	Capt.
Nokomis	Welsch, Charles C.	Maj.
Oak Park	Howie, Edward E.	Capt.
Oak Park	McEwen, William L.	Capt.
Oak Park	Sothras, Nicholas S.	Capt.
Oak Park	Vopata, William O.	Maj.
Olney	Ronalds, Joe G.	Capt.
Peoria	May, Robert L.	Capt.
Petersburg	Carter, Theodore F.	Capt.
Rockford	Fisk, Marvin M.	Capt.
St. Louis	Hodgson, Edward W.	Capt.
Skokie	Vocat, Joseph A.	Capt.
Waukegan	Becklian, Kacheg T.	Capt.
Wheeler	Riley, Medfred S.	Lt. Col.
Winnetka	McEvoy, Leonard L.	Capt.
Wyanet	Gingrich, Orlyn D.	Lt. Col.

Indiana

Bedford	Lundy, Carl G.	Capt.
Brazil	Carpenter, George H.	Maj.
Cicero	Lively, Robert E.	Capt.
Culver	Leonard, Ralph O.	Lt. Col.
Decatur	DeVor, Harold V.	Capt.
East Chicago	Jaraez, Leonard J.	Capt.
Evansville	Grether, James C.	Capt.
Evansville	Rycroft, Chester A., Jr.	Maj.
Flora	Lynch, Weldon J.	Maj.
Frankfort	Walker, James B.	Capt.
Franklin	Pease, Edward L.	Capt.
Freelandville	Kirchoff, Arnold W.	Maj.
Goshen	Forney, Paul D.	Capt.
Indianapolis	Bettcher, Edward P.	Capt.
Indianapolis	Gonzalez, Jose A.	Lieut.
Indianapolis	Herman, Sidney	Capt.
Indianapolis	Himelstein, Morris	Capt.
Indianapolis	Irwin, Don R.	Maj.
Indianapolis	Kauffman, Charles P.	Capt.
Indianapolis	Koss, William F.	Capt.
Indianapolis	Nicolai, James F.	Maj.
Indianapolis	Wurtz, Raymond A.	Capt.
Kendallville	Keenan, Burton	Maj.
Madison	McCormick, D. J.	Capt.
New Albany	Barco, Martin T.	Capt.
New Albany	Thurman, Harry B.	Capt.
Princeton	House, William J.	Maj.
South Bend	Grillo, Samuel	Capt.
Syracuse	Stoelting, Karl W.	Capt.
Terre Haute	Minnis, Joseph C., Jr.	Capt.
Terre Haute	Mohr, Joseph F.	Capt.
Valparaiso	Sheffield, Thomas B.	Maj.
Washington	Scudder, Charles P.	Maj.

Iowa

Akron	Mason, Chester R.	Capt.
Avoca	Grulke, Duane A.	Capt.
Clinton	Bloom, Archie C.	Capt.

Clinton	McKeever, Henry J.	Capt.
Davenport	O'Brien, Michael L.	Maj.
Des Moines	Hensing, Clarence R.	Capt.
Des Moines	Lawson, Raymond O.	Capt.
Dubuque	Rivers, James W.	Capt.
Fonda	Tolan, Justin C.	Capt.
Fort Dodge	Schwidder, Arthur J.	Capt.
Hamburg	Bang, Jacob H.	Capt.
Hull	Vander Wilt, Dick G.	Capt.
Iowa City	Blaha, David D.	Capt.
Latimer	Wirtz, Milton S.	Maj.
Marshalltown	Pegg, Gilbert L.	Capt.
Mason City	Hale, Merle L.	Capt.
Mediapolis	Lofgren, Ronald E.	Capt.
Muscatine	Potter, John W.	Maj.
Newton	Reese, David M.	Lt. Col.
Oelwein	Feld, John W.	Capt.
Oskaloosa	Raetz, Edward W.	Capt.
Ottumwa	Murphy, Albert K.	Maj.
Sioux City	Glann, George W.	Maj.
Sioux City	Larson, Ture L. B.	Capt.
Sioux City	London, Lionel H.	Capt.
Sioux City	O'Connor, A. M.	Capt.
Stuart	Miller, Leo Francis	Maj.
Waterloo	Claus, Everett C.	Lt. Col.
Waukon	Meirkord, John F.	Capt.
Winterset	Koehn, Cyril O.	Capt.
	Kansas	
Almena	Gierhart, Frank E.	Capt.
Bird City	Nichol, Ralph C.	Maj.
Concordia	Anderson, Leslie E.	Capt.
Council Grove	Harvey, Scott B.	Capt.
El Dorado	Schuman, Clyde F.	Capt.
Galatia	Haun, Richard M.	Capt.
Kinsley	Iserman, Eugene W.	Capt.
Lawrence	Alexander, Carlos J.	Capt.
Marysville	Ewart, Ryland Kirk	Maj.
Russell	Stewart, Dean H.	Capt.
St. Mary's	Murphy, Donald E.	Capt.
Salina	Osborn, Burton W.	Lieut.
	Kentucky	
Ashland	Dickson, Hull F.	Capt.
Cave City	Payton, James T.	Capt.
Frankfort	Hoge, James W.	Capt.
Glasgow	Burdette, Robert H.	Capt.
Jeffersontown	Skaggs, James E., Jr.	Capt.
Lexington	Lee, Johnson C.	Capt.
Louisville	Armstrong, L. L.	Capt.
Louisville	Craddox, Robert W.	Lieut.
Louisville	Davis, William F.	Capt.
Louisville	Owen, Norris G.	Lieut.
Louisville	Thompson, Harold C.	Capt.
Morgantown	Willis, William E.	Capt.
Providence	Cooper, Rufus S.	Capt.
Scottsville	Huntsman, Glenn T.	Capt.
Winchester	Reese, Wallace K., Jr.	Capt.
	Louisiana	
Amite	Burnham, H. E., Jr.	Capt.
Baton Rouge	Norwood, York	Capt.
Hammond	Dantone, Joseph D.	Capt.
Monroe	Smith, William E., Jr.	Capt.
New Orleans	Chambers, Charles A.	Maj.
New Roads	Durrl, Homer J.	Capt.
Rayville	Murphy, Richard J.	Capt.
Vivian	Caldwell, Charles B.	Capt.
	Maine	
Caribou	Corey, George T.	Capt.
Lewiston	Marcotte, Yvon W.	Capt.
	Maryland	
Baltimore	Fischer, William A.	Capt.
Baltimore	McCausland, C. P.	Capt.
Baltimore	Maier, Frederick S.	Lt. Col.
Baltimore	Meinster, Leon H.	Maj.
Baltimore	Swinehart, Darwin R.	Maj.
Baltimore	Tighe, Joseph M.	Capt.
	Massachusetts	
Adams	Marsh, Edmond F.	Maj.
Baldwinsville	Fletcher, Louis H.	Capt.
Boston	MacIntosh, W. D.	Lt. Col.
Brookline	Levy, Earl I.	Capt.
Brookline	Solomon, Chester I.	Capt.
Chelsea	Sharff, Hyman	Capt.
Concord	Spencer, Norman C.	Lt. Col.
Dedham	Burns, James J.	Capt.
Dorchester	Goldblatt, Sidney M.	Capt.
Dorchester	Tarutz, Solomon P.	Capt.
Fall River	Fairtile, Franklin M.	Capt.
Fitchburg	McMurray, Francis B.	Maj.
Framingham	England, Lloyd C.	Capt.
Franklin	Vena, Albert J.	Capt.
Grafton	Budge, Paul L.	Capt.
Great Barrington	Homer, Hartwell	Maj.
Great Barrington	Mesick, Charles D.	Capt.
Haverhill	Griffin, George L.	Capt.
Lawrence	Quellette, R. T.	Lieut.
Lawrence	Silverman, M. J.	Capt.
Malden	Zafran, William J.	Capt.
Medford	Harrington, C. F.	Capt.
Medford	Smith, David L.	Capt.
Melrose	Hawes, John A., Jr.	Capt.
Methuen	Hyde, Robert J.	Capt.
Milton	O'Neill, Gerald L.	Capt.
Newton	Moriarty, William L.	Maj.
Newton	Shpiner, Harry B.	Capt.
Newtonville	Phillips, Larz M.	Capt.
Pittsfield	Eramo, William S.	Maj.
Pittsfield	Leavitt, Jason C. L.	Capt.
Plymouth	Policow, Myron A.	Capt.
Revere	Nizel, Abraham E.	Maj.
Roxbury	Binder, Irving	Capt.
Roxbury	Guralnick, Walter C.	Capt.
Roxbury	Rubenstein, Milton	Maj.
Salem	Story, Sherman A.	Capt.
Somerville	Gregory, Sirak K.	Lieut.
Somerville	Hynes, John E.	Capt.
South Egremont	Kop, Willem	Capt.
Springfield	Cohen, David O.	Capt.
Springfield	Tillman, Eugene J.	Capt.
Taunton	Coyle, Edward F.	Capt.
Taunton	Kiernan, T. F., Jr.	Capt.
Topsfield	Bouchard, Laurent A.	Capt.
Turners Falls	Olchowski, Edward F.	Capt.
Winthrop	Levine, Philip T.	Capt.
Woburn	Quinn, Charles E.	Capt.
Wollaston	Loftus, Edward R.	Capt.
Worcester	Forman, Louis R.	Capt.
Worcester	Ginns, Albert	Maj.
	Michigan	
Ann Arbor	Hays, John W.	Capt.
Bad Axe	Hogan, Maurice T.	Capt.

Bay City	Klenow, Russell J.	Capt.
Birch Run	Hubinger, Herman L.	Maj.
Buchanan	Strayer, Robert C.	Capt.
Charlotte	Cole, Donald F.	Capt.
Dearborn	Miller, George J.	Capt.
Dearborn	Zurawski, Roland T.	Capt.
Detroit	Altman, Harry D.	Lieut.
Detroit	Begelman, Irving	Capt.
Detroit	Davis, Joseph N.	Capt.
Detroit	Dowd, John F.	Capt.
Detroit	Gutterman, David D.	Capt.
Detroit	Heller, George P.	Capt.
Detroit	Howard, Widmer E.	Capt.
Detroit	Jacobs, Martin M.	Lieut.
Detroit	Lappin, Milton M.	Capt.
Detroit	Putnam, Lynn L.	Maj.
Detroit	Reader, Zar A.	Capt.
Detroit	Rehfield, Alfred L.	Maj.
Detroit	Silver, David I.	Lieut.
Detroit	Speck, Conrad F.	Capt.
Detroit	Stern, Robert O.	Capt.
Detroit	Ujda, Bruno J.	Capt.
East Lansing	Leavitt, Tod J., Jr.	Capt.
Gaylord	Berry, William H.	Capt.
Grand Rapids	Benjamin, Edward C.	Capt.
Houghton	Gekas, Peter J.	Capt.
Howell	Law, David E.	Capt.
Ironwood	Ketola, Fillmore E.	Capt.
Monroe	Kipp, Kenneth E.	Maj.
Mt. Clemens	Lubahn, William F.	Capt.
Pigeon	Buchholz, Albert E.	Capt.
St. Clair	McCarthy, R. A.	Capt.
Traverse City	Meach, Charles L., Jr.	Capt.
Wayland	Baker, Russell L.	Capt.
Zeeland	Van Kley, LaVern A.	Capt.

Minnesota

Albert Lea	James, Maynard R.	Capt.
Austin	Sitz, Chester D.	Maj.
Barnesville	Janecky, Woodbern J.	Capt.
Cambridge	Arnegard, Newell H.	Capt.
Cottonwood	Huso, Robert K.	Lieut.
Duluth	Olsen, Edmund S., Jr.	Maj.
Elmore	Clark, Melvin H.	Capt.
Excelsior	Hemsey, George J.	Capt.
Grand Rapids	Stromberg, Carl G.	Capt.
Hibbing	Sachs, Bertram H.	Capt.
Lake City	Schwartz, Gerald R.	Capt.
Litchfield	Aga, Clarence E.	Capt.
Long Prairie	Hart, Robert W.	Capt.
Minneapolis	Anderson, Clifford W.	Lieut.
Minneapolis	Aspnes, Garnet S.	Lieut.
Minneapolis	Greenberg, Sherman	Capt.
Minneapolis	Hagen, Russell O.	Capt.
Minneapolis	Heiele, Marion T.	Capt.
Minneapolis	Krumbiegel, C. E.	Capt.
Minneapolis	McCormack, Delos W.	Capt.
Minneapolis	McEachran, G. S.	Capt.
Minneapolis	McReynolds, R. L.	Capt.
Minneapolis	Purvis, James R.	Lieut.
Parkers Prairie	Post, Harvey J.	Lieut.
Rochester	Conklin, William W.	Capt.
Royalton	Pollock, Peter B.	Capt.
St. Louis Park	Casey, John T.	Lieut.
St. Louis Park	Erickson, Owen M.	Capt.
St. Paul	Broderson, Philip J.	Capt.
St. Paul	Judkins, Harold E.	Maj.
St. Paul	Kellerman, Edward S.	Maj.
St. Paul	Lindstrom, Roland L.	Capt.
St. Paul	McEvoy, Robert J.	Capt.
St. Paul	Ostergren, Daniel E.	Capt.
Wabasha	Kasper, Raymond E.	Capt.
Winona	Frederiksen, Judd L.	Capt.

Mississippi

Abbott	Naugle, Andrew K., Jr.	Maj.
Laurel	Waits, Thomas H.	Maj.
Natchez	King, William A.	Maj.
Osyka	Cutrer, Edward A.	Capt.

Missouri

Campbell	Whiteaker, R. A., Jr.	Capt.
Cassville	Blandenship, E. M.	Capt.
Drexel	Cowden, Robert W.	Capt.
Ferguson	Adles, Galen H.	Maj.
Fornfelt	Holly, Bert F.	Maj.
Hermann	Ruediger, Norman E.	Maj.
Independence	Lee, William J.	Capt.
Jefferson City	Renn, Harold J.	Capt.
Kansas City	Chambers, Robert N.	Capt.
Kansas City	Hook, Kenneth B.	Capt.
Kansas City	Klee, Franklin E.	Capt.
Kansas City	Murray, Howard J.	Capt.
Kansas City	Peterson, T. M.	Lt. Col.
Kansas City	Savage, Hugh A.	Lieut.
Kirksville	Walcher, Everett E.	Capt.
Louisiana	Ligon, James E.	Capt.
Maplewood	Marshall, Kenneth C.	Capt.
Maryville	Wilson, Robert W.	Capt.
Piedmont	Knox, Gerald E.	Capt.
St. Genevieve	Rehm, Walter L.	Capt.
St. Louis	Berkin, Harry L.	Capt.
St. Louis	Eberhart, Hilmar L.	Capt.
St. Louis	Ehlers, Waldo H.	Maj.
St. Louis	Grimaud, James C.	Capt.
St. Louis	Gross, Byron B.	Capt.
St. Louis	Herminghaus, M. F.	Capt.
St. Louis	Hodapp, Raymond J.	Maj.
St. Louis	Hoge, James F.	Capt.
St. Louis	Ingram, Glenn R.	Capt.
St. Louis	Klein, Clemence	Capt.
St. Louis	Meyer, Walter G.	Maj.
St. Louis	Offstein, Gus	Capt.
St. Louis	Reichman, Edward P.	Capt.
St. Louis	Sappington, R. W.	Capt.
St. Louis	Smercina, Harold A.	Capt.
St. Louis	Summers, Francis W.	Maj.
St. Louis	Westcott, Lyman, Jr.	Capt.
St. Louis	Zink, Martin V. B.	Capt.
St. Louis County	Aberle, Ralph T.	Maj.
Smithville	Miller, George F.	Capt.
Weston	Basler, Frank L.	Capt.

Montana

Great Falls	Hull, George C.	Capt.
Missoula	Mosgrove, Richard L.	Capt.
Polson	Lodmell, Ernest W.	Capt.

Nebraska

Beatrice	Jackson, Herbert S.	Capt.
Beatrice	Knapp, Ray M.	Maj.
Clarkson	Jirovec, Donald J.	Capt.
Emmet	Dailey, Arthur E.	Capt.
Fullerton	Fonda, Glen C.	Capt.
Heartwell	Smith, James J., Jr.	Capt.
Lincoln	Krewson, C. B., Sr.	Capt.

Lincoln	Webster, William W.	Maj.
Lyons	Eimers, Joseph E.	Capt.
Omaha	Donovan, Eugene M.	Capt.
Omaha	McCreary, Edward R.	Capt.
Omaha	Stewart, Robert E.	Capt.
Scribner	Krajicek, Dayton D.	Capt.
Scribner	Vesely, Raynold J.	Capt.
Wahoo	Margrave, Alfred B.	Capt.
	New Hampshire	
Berlin	Morris, Robert J.	Lieut.
Claremont	Esersky, Joseph	Capt.
Keene	Fitzgerald, Gerald S.	Capt.
Manchester	Bondar, Andrew A.	Capt.
Manchester	Jacques, Edgar J.	Col.
Nashua	Hagerty, Norman A.	Maj.
Tilton	Achber, Kenneth	Capt.
Woodsville	Christopher, Leo C.	Capt.
	New Jersey	
Atlantic City	Formica, Nicholas H.	Capt.
Bayonne	Katko, Andrew A.	Capt.
Bayonne	Sommers, Moe R.	Capt.
Bridgeton	Feinstein, Arthur,	Capt.
Camden	Asbell, Milton B.	Capt.
Camden	Cutler, Bernard	Capt.
East Orange	Hotaling, Arnold G.	Capt.
Elizabeth	Craig, Leonard B.	Capt.
Elizabeth	Quinn, Ralph R.	Capt.
Grantwood	Carhart, Alfred	Capt.
Hackensack	Rose, Sydney A.	Lieut.
Jamesburg	Weisert, James F.	Lieut.
Jersey City	Davis, Mortimer C.	Capt.
Jersey City	Garber, Joseph	Maj.
Jersey City	Grodjesk, Joseph E.	Capt.
Jersey City	Handel, Bernard L.	Capt.
Jersey City	Krasnow, George	Capt.
Jersey City	Pash, David T.	Capt.
Jersey City	Richard, Anthony C.	Capt.
Jersey City	Schluger, Saul S.	Capt.
Keyport	Ralph, Joseph E.	Capt.
Linden	Miller, William A. C.	Capt.
Maplewood	Huttenbach, R. L.	Capt.
Mays Landing	Goldman, Jerome B.	Capt.
Montclair	Sherman, Nathan T.	Capt.
Montclair	Soltanoff, Walter	Capt.
Mt. Holly	Lord, Arthur R.	Capt.
Newark	Consovoy, Charles G.	Capt.
Newark	Ferraro, Albert C.	Capt.
Newark	Honigfeld, Irwin	Capt.
Newark	Jordan, Wilfred W.	Capt.
Newark	Moccia, Anthony R.	Capt.
Newark	Wien, Robert	Lieut.
North Bergen	Brenwasser, Sidney S.	Capt.
North Bergen	Gatti, Harold L.	Capt.
Orange	McHugh, Joseph A.	Capt.
Orange	Schectman, Stuart B.	Capt.
Palmyra	Folkman, Emanuel N.	Maj.
Passaic	Malarik, Eugene C.	Capt.
Paterson	Hopper, Carlton E.	Capt.
Plainfield	Hymanson, N. W.	Capt.
Rahway	Heller, Archie E.	Capt.
Red Bank	Hawkins, Joseph J.	Capt.
Robbinsville	Haveson, Milton	Capt.
Sea Girt	Madden, T. H.	Lt. Col.
Summit	Bloomstein, Abraham	Capt.
Summit	Martin, Thomas W.	Maj.
Trenton	Gansl, Samuel	Capt.
Trenton	Kolman, Irvin O.	Capt.
Union City	Novak, Roland A.	Capt.
Westmont	Ruehlman, Edward L.	Capt.
Woodbury	Budd, Byron B.	Capt.
	New Mexico	
Albuquerque	Thelin, Alfred L.	Capt.
Raton	Saul, William H.	Capt.
Santa Fe	Lopez, Alfred L.	Capt.
	New York	
Albany	Sheehan, William A.	Capt.
Albany	Steuerwald, Clinton F.	Capt.
Albany	Wald, Louis	Capt.
Astoria	Alexander, Jerry M.	Capt.
Astoria	Breger, Herbert J.	Capt.
Atlantic Beach	Miller, Leslie W.	Capt.
Auburn	Locastro, Anthony T.	Capt.
Auburn	Oristian, Michael	Capt.
Bay Shore	Brewster, Ellis B.	Capt.
Bronx	Adler, David	Lieut.
Bronx	Bernstein, Leon	Capt.
Bronx	Boxer, Leon	Capt.
Bronx	Cohen, Charles	Capt.
Bronx	Cohen, George	Capt.
Bronx	Dinin, Abraham P.	Lieut.
Bronx	Ellenberg, Arthur	Lieut.
Bronx	Goldfinger, Jesse	Capt.
Bronx	Greenberg, Israel N.	Lieut.
Bronx	Greiper, Louis P.	Capt.
Bronx	Gruder, Saul	Capt.
Bronx	Kleinman, Sol	Capt.
Bronx	Kriesberg, Irving	Capt.
Bronx	Krugler, David	Capt.
Bronx	Male, Henry	Capt.
Bronx	Ollman, Abraham, A.	Capt.
Bronx	Piazza, Louis R.	Capt.
Bronx	Robinson, Seymour	Capt.
Bronx	Salkind, Milton	Capt.
Bronx	Scheim, Rudolph	Capt.
Bronx	Singer, Benjamin R.	Capt.
Bronx	Wasserman, Milton	Capt.
Bronx	Wittes, Harold N.	Capt.
Bronx	Yarchoan, Zachary	Capt.
Brooklyn	Adams, Elias	Capt.
Brooklyn	Adler, Leonard	Capt.
Brooklyn	Alenick, George	Capt.
Brooklyn	Axelrod, Arthur	Capt.
Brooklyn	Beckoff, Nathan	Lieut.
Brooklyn	Bell, Murray	Capt.
Brooklyn	Bender, Sidney	Capt.
Brooklyn	Benza, Frank C.	Capt.
Brooklyn	Bergman, Julian L.	Capt.
Brooklyn	Berkowitz, Julius	Capt.
Brooklyn	Bernstein, Benjamin	Capt.
Brooklyn	Bluestone, Leonard I.	Capt.
Brooklyn	Borkow, Nathan	Capt.
Brooklyn	Bottone, Alfred A., Jr.	Capt.
Brooklyn	Brodsky, Abraham I	Capt.
Brooklyn	Byron, Albert	Capt.
Brooklyn	Cantor, Harry	Capt.
Brooklyn	Cantor, Philip E.	Capt.
Brooklyn	Chenault, Hortenius	Capt.
Brooklyn	Chinitz, Irving	Capt.
Brooklyn	Cohen, Leon L.	Capt.
Brooklyn	Eigen, Morris	Capt.
Brooklyn	Elterman, A. R.	Capt.
Brooklyn	Erlitz, Perry D.	Capt.

Brooklyn	Fine, Charles M.	Capt.	Deposit	Merchant, Hubert W.	Capt.
Brooklyn	Fleischman, Aaron	Capt.	East Patchogue	Gallo, Sullivan A.	Capt.
Brooklyn	Fradin, Irving	Capt.	Ebenezer	Hegdus, William A.	Capt.
Brooklyn	Friedman, Meyer	Capt.	Ellenville	Tannenbaum, S.	Capt.
Brooklyn	Garnett, Harry	Capt.	Elmhurst	Freed, Seymour W.	Capt.
Brooklyn	Gerard, Vernon A.	Capt.	Far Rockaway	Stutzel, Ralph M.	Capt.
Brooklyn	Goldblatt, David H.	Capt.	Flushing	Krentzman, George	Capt.
Brooklyn	Goldin, Julius	Capt.	Flushing	Rawitz, Joseph S.	Capt.
Brooklyn	Goldman, William	Capt.	Flushing	Salovin, Sidney O.	Capt.
Brooklyn	Goldstein, Eli	Capt.	Flushing	Shapiro, George W.	Capt.
Brooklyn	Goldstein, Jesse	Capt.	Flushing	Sloane, Samuel N.	Lieut.
Brooklyn	Gordon, Emanuel J.	Capt.	Forest Hills	Brooks, Leonard P.	Capt.
Brooklyn	Greenberg, Max	Lieut.	Forest Hills	Jacobson, William H.	Capt.
Brooklyn	Greenberg, Meyer	Capt.	Forest Hills	Kwartin, Paul	Capt.
Brooklyn	Gulant, Benjamin	Capt.	Forest Hills	Marcus, Abraham	Lieut.
Brooklyn	Halpern, Julius	Capt.	Forest Hills	Orlean, Sol L.	Capt.
Brooklyn	Harris, Leonard W.	Capt.	Freeport	Appleton, Arnold B.	Capt.
Brooklyn	Holand, Einar	Capt.	Garden City	Stahl, Joseph J.	Maj.
Brooklyn	Hyman, Louis	Capt.	Greenport	Goldin, Leo N.	Maj.
Brooklyn	Kafka, Arthur D.	Maj.	Hamilton	Oates, John H.	Capt.
Brooklyn	Kahn, Morton	Capt.	Jamaica	Burbank, Irving	Lieut.
Brooklyn	Kamenstein, N. H.	Capt.	Jamaica	Savedoff, Frederic	Capt.
Brooklyn	Kessler, Louis M.	Capt.	Jamestown	Sanctuary, Gordon R.	Capt.
Brooklyn	Klein, Arthur	Capt.	Kenmore	Atkinsin, Ralph W.	Lieut.
Brooklyn	Klein, Robert I.	Lieut.	Kenmore	Lindeman, Howard C.	Capt.
Brooklyn	Kolodny, David	Capt.	Kew Gardens	Jaye, William	Capt.
Brooklyn	Korn, Abraham	Lieut.	Lawrence	Wisan, Aaron D.	Capt.
Brooklyn	Krauss, Sidney	Capt.	Long Beach	Harris, Milton	Capt.
Brooklyn	Kronley, Samuel	Capt.	Long Beach	Kollender, N. M.	Capt.
Brooklyn	Kruchkow, Norman	Capt.	Long Island	Levine, Hyman H.	Lieut.
Brooklyn	Lazarus, Samuel	Capt.	Monticello	Trachtenberg, N. B.	Capt.
Brooklyn	Levine, Milton	Capt.	Mt. Vernon	Heaps, Irving	Capt.
Brooklyn	Levine, Theodore	Capt.	Mt. Vernon	Katz, Martin M.	Capt.
Brooklyn	Oshrain, Herbert I.	Capt.	Mt. Vernon	Ross, Edwin J.	Capt.
Brooklyn	Portnoy, Jacob H.	Capt.	Mt. Vernon	Swift, Thomas H.	Maj.
Brooklyn	Rifkin, Leopold	Capt.	New Rochelle	Altman, Jack J.	Maj.
Brooklyn	Rosen, Sidney	Lieut.	New York	Auslander, Walter P.	Capt.
Brooklyn	Rosenbaum, Harold	Capt.	New York	Barnes, Ivan F.	Capt.
Brooklyn	Rubin, Eugene L.	Capt.	New York	Baumoehl, Abraham	Capt.
Brooklyn	Saxe, Frank	Maj.	New York	Bermak, Marcus	Capt.
Brooklyn	Schoolnik, Daniel	Capt.	New York	Birnbach, Emanuel E.	Capt.
Brooklyn	Seldin, Morris	Capt.	New York	Cederbaum, Alvin D.	Capt.
Brooklyn	Senreich, Seymour	Capt.	New York	Cohen, Milton J.	Capt.
Brooklyn	Shapiro, Morris W.	Capt.	New York	Cohen, Mortimer J.	Capt.
Brooklyn	Sherman, Leo E.	Capt.	New York	Corrado, John V.	Capt.
Brooklyn	Sokol, Herbert A.	Capt.	New York	Davidoff, Arthur	Capt.
Brooklyn	Speciale, Philip J.	Lieut.	New York	Diner, Nathaniel	Capt.
Brooklyn	Stone, Harvey A.	Capt.	New York	Dubrul, Ernest L.	Maj.
Brooklyn	Trow, Henry	Capt.	New York	Eckstein, Philip	Capt.
Brooklyn	Weissman, Abraham	Capt.	New York	Eder, Melvin A.	Capt.
Brooklyn	Wetrogan, Joseph	Capt.	New York	Eisenberg, Milton	Capt.
Brooklyn	Wood, Julius	Capt.	New York	Epstein, Charles C.	Capt.
Brooklyn	Wroblewski, Joseph F.	Capt.	New York	Fiedelbaum, Maurice	Capt.
Brooklyn	Zornow, Jack	Capt.	New York	Fine, Mortimer C.	Capt.
Buffalo	Arbesman, Irwin D.	Capt.	New York	Freeman, Daniel B.	Capt.
Buffalo	Drumsta, Casimir D.	Capt.	New York	Fried, Louis	Capt.
Buffalo	Jung, Paul H.	Capt.	New York	Gabel, Milton	Capt.
Buffalo	Lesser, George V.	Capt.	New York	Goldenthal, Edgar J.	Lieut.
Buffalo	Rampulla, Lucio T.	Capt.	New York	Goldman, Seymour	Capt.
Buffalo	Reen, Michael D.	Capt.	New York	Goldschein, Irving	Capt.
Buffalo	Tracy, Charles A.	Capt.	New York	Goldstein, Charles J.	Capt.
Buffalo	Varco, Anthony J.	Capt.	New York	Greenwald, Martin S.	Capt.
Cazenovia	Hibbard, William J.	Capt.	New York	Gross, William	Capt.
Chappaqua	Greminger, Albert N.	Maj.	New York	Gubman, Hyman	Capt.
Corning	Hall, Harry J.	Capt.	New York	Handelman, C. A.	Capt.
Corona	Giannasio, Frank	Capt.	New York	Handelman, Samuel R.	Maj.
Cortland	Kerwin, Donald C.	Capt.	New York	Horados, Bernard S.	Capt.
Delhi	Schlafer, Reynold W.	Capt.	New York	Jaeger, Charles K.	Capt.

New York	Kaplan, William	Capt.
New York	Katz, Harry W.	Lieut.
New York	Kayne, Clyde B.	Lt. Col.
New York	Klein, Philip I.	Capt.
New York	Krat, Rubin L.	Capt.
New York	Langel, Lester	Capt.
New York	Lederkramer, Leon	Capt.
New York	Levanthal, Jacques M.	Capt.
New York	Linder, Martin	Capt.
New York	Lipman, Barney	Capt.
New York	Luban, Joseph	Capt.
New York	Marone, Anthony V.	Lieut.
New York	Meirowitz, Morris H.	Capt.
New York	Nussbaum, Murray	Capt.
New York	Pickholz, William	Capt.
New York	Press, Robert	Capt.
New York	Rahm, Henry J.	Capt.
New York	Rakov, Jerome	Capt.
New York	Raport, Leo H.	Capt.
New York	Rhodes, Henry L.	Capt.
New York	Rubenstein, Henry S.	Capt.
New York	Ryan, Donald F.	Capt.
New York	Sheckman, Nathan M.	Capt.
New York	Sohigian, Diran	Capt.
New York	Stillman, Stanley	Lieut.
New York	Taylor, Joseph S.	Capt.
New York	Welsch, Julian	Capt.
New York	Zimmerman, M. M.	Capt.
New York	Zweben, Leon L.	Capt.
Niagara Falls	Moses, Joffre	Maj.
Nunda	Weaver, John L.	Capt.
Ogdensburg	Fisher, Louis	Capt.
Ossining	Kipp, Ralph P.	Capt.
Oswego	Snyder, Charles H.	Capt.
Pearl River	Carpenter, C. E.	Capt.
Pelham Manor	Spengeman, Walter G.	Capt.
Penn Yan	Salisbury, Roger M.	Capt.
Pine Plains	Bowman, Ralph J.	Maj.
Plattsburg	Kelly, John C.	Capt.
Port Chester	Feinstein, Alan	Capt.
Port Jervis	Zeger, Jack I.	Capt.
Poughkeepsie	DuBois, Stanley P.	Maj.
Poughkeepsie	Ehleider, Thomas J.	Capt.
Poughkeepsie	Stamm, David	Capt.
Ridgewood	Cohen, Albert	Capt.
Rochester	Bakeman, Paul E.	Capt.
Rochester	Eichen, David	Capt.
Rochester	Fisher, Arthur F.	Capt.
Rochester	Katzman, Irving	Capt.
Rochester	Knight, Robert F.	Capt.
Rochester	Kowal, Phillip	Capt.
Rochester	Mossis, Jacob	Capt.
Rochester	Rowan, Robert J.	Capt.
Rockaway Park	McCauley, John J.	Capt.
Rockville Center	Babbidge, Douglass P.	Capt.
St. Albans	Gudeon, Max	Capt.
St. George	Greenspan, Bernard	Capt.
Schenectady	Gold, Morton I.	Capt.
Schenectady	Miklowitz, Herman	Capt.
Schenectady	Yulman, Irving J.	Capt.
Staten Island	Gottlieb, Herbert M.	Lieut.
Syracuse	Del Balso, Jerry J.	Capt.
Syracuse	Hummer, Robert W.	Capt.
Syracuse	Klett, Stanley L.	Capt.
Syracuse	Roblin, Arthur C.	Lt. Col.
Syracuse	Sullivan, John J.	Capt.
Tarrytown	Lebovitz, Herbert M.	Capt.
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Wyoming

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CURRENT LITERATURE

Streptomycin: Absorption, Diffusion, Excretion, and Toxicity. D. H. Heilman, F. R. Heilman, H. C. Henshaw, D. R. Nichols and W. E. Herrell. Am. J. M. Sc. 210:576, November 1945.

Streptomycin, an antibiotic substance which may prove of value in treatment of infections caused by certain gram-negative, gram-positive and acid-fast bacteria, has been administered to a number of human beings in amounts which could, on a theoretic basis, be regarded as therapeutically effective. The material can be administered intravenously, intramuscularly, intrathecally, subcutaneously, orally, and by nebulization. It appears that, if intermittent parenteral administration is to be used, the substance should be given at least every three or four hours.

Apparently streptomycin does not readily diffuse into the cerebrospinal fluid unless large doses are administered. After parenteral administration, it is readily absorbed into the general circulation and is excreted largely in the urine. The substance appears to diffuse through the placenta and to enter the fetal circulation. It also appears to be concentrated and excreted in the bile.

Serious and uncontrollable toxic reactions have not been encountered after administration of fairly large amounts of streptomycin. In some instances, streptomycin has been administered to patients for a considerable time without evidence of toxic reactions.—*Paul H. Keyes.*

Progress in the Treatment of Subacute Bacterial Endocarditis. C. B. Favour, C. A. Janeway, J. G. Gibson and S. A. Levine. New England J. Med. 234:71, January 1946.

In 347 cases of subacute bacterial endocarditis treated at the Peter Bent Brigham Hospital (Boston) from 1913-1945, there were no known recoveries among 237 cases seen between 1913 and 1937.

From 1937 to 1943, fifty-five cases received adequate treatment with a sulfonamide. Of these, one treated by infra-red radiation and three treated with typhoid vaccine recovered and have remained well for from two to four years. None of the other sulfonamide treated patients recovered.

Since January 1944, seventeen patients were given large doses of penicillin. In eleven cases the infection has been cured or arrested. The follow-up periods vary from six to eighteen months.

Dental sepsis, extraction of teeth and dental manipulations were found to be related to the onset of this disease in a surprisingly large number of cases. Infected teeth should be removed before treatment is completed, as a prophylaxis against subsequent reinfection of the heart valves.

Although penicillin appears to be a promising cure for subacute bacterial endocarditis, patients who recover are left with the same or further valvular deformities which continue to predispose them to reinfection or to subsequent congestive heart failure. Successful treatment depends on maintaining penicillin blood levels in excess of the minimal inhibiting concentration of penicillin for the patient's organism.—*Paul H. Keyes.*

Nutritional Survey in Norris Point, Newfoundland. J. Metcoff, G. A. Goldsmith, A. J. McQueeney, R. F. Dove, E. McDevitt, M. A. Dove and F. J. Stare. J. Lab. & Clin. Med. 30:475, June 1945.

A survey of the nutritional status of a group of recently pregnant women, their children, some of their husbands and a few additional men living in Norris Point, Newfoundland, is reported. The group represented was receiving the poorest nutrition in the community and consisted of 39 women, 34 children 3-6 years old, 24 children 10-14 years old and 16 men.

On the basis of medical histories, physical examination, hemoglobin and plasma protein determinations, the incidence of nutritional deficiency among the women was: apparent, 61 per cent; suggestive, 31 per cent; ques-

tionable or none, 8 per cent. Children were similarly evaluated and showed: preschool group: apparent deficiency, 23 per cent; suggestive, 47 per cent; questionable or none, 30 per cent; preadolescent group: apparent deficiency, 29 per cent; suggestive, 27 per cent; questionable or none, 42 per cent. Of the men, 44 per cent had apparent, 44 per cent suggestive and 12 per cent questionable or no deficiency.

Multiple deficiencies were the rule, and those most frequently encountered were vitamin A, riboflavin and iron deficiencies in the women and children, and vitamin A and riboflavin deficiencies in the men. Marked dental caries was recorded in 44 per cent of the women, 29 per cent of the children and 31 per cent of the men. Severe periodontal disease was noted in 26 per cent of the women, 3 per cent of the children and 19 per cent of the men. Twenty per cent of the children had evidence of old rickets.—*Paul H. Keyes.*

The Masticatory Effect. B. Dahlberg. Acta. med. Scandinav., Suppl. 89, 1942.

This monograph of 154 pages represents the results of a detailed, comprehensive investigation into the efficiency of mastication. Survey of previous work is followed by description of a reproducible method for determining masticatory efficiency. The test substance finally decided on was 15 per cent gelatin containing 5 per cent barium sulfate and red coloring matter. It was provided in the form of cylinders which were hardened by the action of formalin. The amount of reduction by chewing was determined by straining the substance through a special apparatus having ten strainers with diameters of holes ranging from 10 mm. to 1 mm. in gradations of 1 mm. The volume and surface area of the test portion were calculated by suitable means. From these a mastication coefficient was calculated which gives square centimeter of area per cubic centimeter of volume in the test portion.

Investigations were made on 200 children and 717 adults of varying ages. Each dentition was classified with regard to the number of teeth and to their occlusion. A contact coefficient was devised which showed how many teeth correspond on the average to one contact in an arbitrary table of points. When subjects were allowed to chew until the portion was considered ready to swallow, there was no significant difference in number of chewing strokes between groups with varying excellence of dentition. A poor set of teeth was not compensated by a greater number of chewing strokes.

A given person chewed a somewhat varying number of times in repeated tests, but the variability was not large. This means that different persons have different chewing habits and that these habits are quite fixed and fairly independent of the result obtained, under the conditions of the test. Differences in the efficiency of mastication run parallel with deterioration of the dentition. The effect of the teeth in a poor dentition, while not compensated by increasing the number of chewing strokes, is compensated, to a certain extent, by an increased skill in management of the mouthful. Different chewing habits and differences in the sets of teeth seem to play about an equal part in the variation in masticatory effect (20-30 per cent in groups with similar dentitions). Test of the chewing conditions with full dentures has shown that the average number of chewing strokes by persons with poor dentures was somewhat higher than the number for those with natural teeth. There was no difference between the number of strokes by persons with good dentures and those with natural teeth. The mastication coefficient corresponded on the average to that in extremely good or good teeth; the variability was great. At its best, a prosthesis gave an effect as good as that of extremely good teeth; at its worst, the effect was below the average obtained in persons with extremely bad teeth.—*J. E. Gilda.*

Salivary-Gland Tumor of the Upper Lip. J. F. Curr. Brit. M. J. No. 4426:605, November 3, 1945.

A painless swelling of the upper lip, present in a girl of 18 for many years, recently increased in size. The swelling was situated in the midline and protruded on the buccal surface, being covered by normal mucous membrane. A solid round tumor was easily enucleated. Histologic examination demonstrated the characteristic appearance of a mixed tumor of the parotid gland. Only thirteen cases of salivary-gland tumors of the lip have been previously reported.—*J. E. Gilda.*

Further Experimental Investigations in the Exchange of Phosphorus in Human Teeth, Using Radioactive Phosphorus as Indicator. P. O. Pedersen and B. Schmidt-Nielsen. Acta Odontologica Scandinav. 4:1, July 1942.

An exchange of phosphate ions between saliva and intact surface enamel was demonstrated in *in vivo* experiments made with two persons. One case involved three entirely sound teeth of a 12-year-old girl, and the other, six devitalized teeth of a 19-year-old man. The order of magnitude was found to be the same *in vivo* as *in vitro*. *In vitro* experiments were made with fifteen freshly extracted sound teeth which were kept at 37° C. in unstimulated saliva (obtained from the latter subject) containing appreciable amounts of labeled isotope.

An exchange was demonstrated between the dental pulp and the dentin, considerably greater than that between saliva and the intact enamel surface. There was no measurable exchange between enamel and dentin. There was no radioactivity in the dentin of devitalized teeth, and no radioactivity in the enamel of vital teeth to which saliva had no access. No exchange between cementum and root dentin could be shown in devitalized teeth. Attempts to imitate incipient dental caries were made by treating enamel surfaces with nitric acid. The etched enamel surface showed an uptake of radioactive phosphorus which was about ten times that of the intact enamel surface, both *in vivo* and *in vitro*.—*J. E. Gilda.*

Dental Caries Experience in Relocated Children Exposed to Water Containing Fluorine. I. Incidence of New Caries After Two Years of Exposure Among Previously Caries-Free Permanent Teeth. Henry Klein. Pub. Health Rep. 60:1462, December 7, 1945.

Two groups of relocated school children (8-14 years of age) of Japanese ancestry were examined for dental caries in the early summer of 1943 and again in the summer of 1945. Examinations were made with the aid of mouth mirror and explorer. In the autumn of 1942 both groups had been transferred from a common center; one group of 120 children to a California relocation center and the other group of 196 to Arizona. The former group consumed water containing 0.1 p.p.m. of fluorine; the latter (except for a three-month period when fluorine-free water could be obtained if so desired) consumed water containing 3 p.p.m. of fluorine. During the two-year period the children were restricted to their respective centers. Their diets were similar and adequate. Analysis of the dental findings over this period reveals that a fluorine content of 3 p.p.m. in the drinking water is associated with a marked reduction in new caries in teeth present in the mouth and free of caries at the beginning of the exposure. Exposure of the erupted permanent teeth of younger children to fluoride waters provides a larger measure of protection against caries than does the same exposure of the erupted teeth of older children. Among teeth present in the mouth at the beginning of exposure to fluorine, those most recently erupted were those most protected against caries attack.—*J. E. Gilda.*

Stevens-Johnson Syndrome (Eruptive Fever with Stomatitis and Conjunctivitis). Simon Kove. Am. J. M. Sc. 210:611, November 1945.

Two cases of Stevens-Johnson syndrome are reported, characterized by an eruptive fever with membranous stomatitis, purulent conjunctivitis and severe constitutional reaction. The first case was treated with sulfadiazine orally in addition to local therapy, and a complete recovery followed. The second case was treated with both sulfadiazine and penicillin. After a protracted and stormy course, a complete recovery resulted, except for mild ocular disturbances.

The effect of either sulfonamide or penicillin therapy upon this syndrome cannot be properly evaluated from a review of these two cases.—*Paul H. Keyes.*

Pigmentation of the Palate and Subungual Tissues Associated with Suppressive Quinacrine Hydrochloride Therapy. V. W. Lippard and G. L. Kaner, Jr. Am. J. Trop. Med. 25:469, November 1945.

A slate grey pigmentation of the hard palate and the subungual areas of the fingers and toes has been observed among troops serving in the southwest Pacific area. In the hard palate, the pigment deposits vary in in-

tensity and color from slate grey to blue black, first appearing near the midline and extending laterally to the gingival margins. Several patients who had partial upper dentures had pigment deposited only in those areas untouched by the prosthetic appliance. The authors failed to observe pigmentation among troops who had been on suppressive quinacrine (atabrine) therapy for less than seven months but found it occurring with increasing frequency among those who had taken the drug over a longer interval. Tropical service alone was not a significant factor in the etiology of this condition. Histologic studies showed that the pigment contains iron in an accessible form and may be hemosiderin.—*J. E. Gilda.*

The Antagonism Between Local Anesthetics and the Sulfonamides. B. S. Walker and M. A. Derow. Am. J. M. Sc. 210:585, November 1945.

Previous work has shown that procaine, an ester of p-aminobenzoic acid, can be hydrolyzed with the liberation of free p-aminobenzoic acid by esterases present in human tissues. Thus the mechanism of inhibition of sulfonamides by procaine can be attributed to its structural similarity to a "natural" antagonist, p-aminobenzoic acid.

The authors of the present paper report that the inhibitory effect of procaine upon sulfathiazole has been found exactly comparable, mol for mol, with that of p-aminobenzoic acid. Certain of the local anesthetics studied showed no inhibitory effect upon the sulfonamides, but actually increased the antibacterial effect.—*Paul H. Keyes.*

Actinomycotic Infection of the Soft Tissues of the Neck: Apparent Cure Following Large Doses of Penicillin. J. H. McCrea, R. A. Steven and O. O. Williams. J. Lab. & Clin. Med. 30:509, June 1945.

The case reported is that of a 28-year-old white man who developed an actinomycotic infection in the right cervical region after the extraction of impacted lower third molars. The very rapid and apparently complete recovery after the administration of massive doses of penicillin (7,000,000 units in fourteen days) is strong presumptive evidence that the cure was due to the drug. Previous smaller doses of penicillin and about two weeks of sulfadiazine administration had failed to effect a cure.—*Paul H. Keyes.*

Tooth Doubling in a Deciduous and Permanent Dentition. T. E. DeJonge. Acta neerl. morphol. 4:362, 1942.

A case of tooth duplication in both dentitions is described and illustrated. The lower second deciduous incisor showed mesiodistal enlargement. A median fissure extended into the crown, dividing the incisal third into two portions. Later, an extra permanent incisor in good alinement appeared in the same region. This was interpreted as a further development of the tendency to twinning shown by the deciduous tooth germ.—*J. E. Gilda.*

The Clinical Oral Pathology Conference as a Teaching and Coordinating Unit. Hamilton B. G. Robinson. J. D. Educ. 8:299, April 1944.

The Clinical Oral Pathology Conference is conducted as part of the school's teaching program. Patients are presented by students at the weekly one-hour conferences and are discussed by students and faculty. Two or three cases are given at each session, mimeographed outlines of the pertinent facts having been distributed prior to the conference. The subjects discussed vary from pulpitis through stomatitis, and include orthodontics, prosthetics, periodontics and oral surgery. The patient's record is presented, pertinent literature is reviewed and roentgenograms are usually utilized to illustrate the points under discussion. The conferences have afforded a valuable means of correlating basic science and clinical science.

DEATHS

Dr. Harry E. Kelsey

Kelsey, Harry Estes, D.D.S., Baltimore; died March 1; aged 73.

Dr. Kelsey was graduated from the Baltimore College of Dental Surgery, University of Maryland, in 1896 and from the Angle School of Orthodontia in 1908. Thereafter he devoted himself to the practice of orthodontics, contributing in an important manner to society programs and to the literature. He taught in the Baltimore College of Dental Surgery for many years and from 1913 to his retirement had been associated with the dental staff of the Johns Hopkins Hospital. Always a proponent of professional organization, he was for many years active in the affairs of the American Dental Association, serving as a member of the Research Council and in various other capacities. Dr. Kelsey served as president of his local dental societies and of the Southern Society of Orthodontists, the New York Society of Orthodontists and the American Association of Orthodontists, and also as a member of the American Board of Orthodontists. He was a member of the Xi Psi Phi dental fraternity, a fellow of the American College of Dentists and an honorary member of Omicron Kappa Upsilon.

Dr. Kelsey was interested in children professionally and was a member of the board of the Henry Watson Children's Aid Society. He was a persistent advocate of library facilities for both graduate and undergraduate students, and much credit should be given him for the establishment of the Clarence J. Grieves Library Foundation. Today it is conceded that this dental library, housed in the Baltimore College of Dental Surgery, ranks among the most complete in the world. In Dr. Kelsey's honor five former associates had created and endowed at the University of Maryland an award to a member of the graduating class who best typifies those fine qualities of a professional gentleman as evidenced by Dr. Kelsey throughout his career.

The dental profession and the specialty of orthodontics have lost a member whose memory will provide an example to those who follow.—*B. Lucien Brun.*

Adams, Thomas H., Lakeland, Fla.; School of Dentistry, Meharry Medical College; died December 26.

Allworth, James D., Gloversville, N. Y.; Baltimore College of Dental Surgery, University of Maryland; died in February.

Bachman, Chauncey C., Waterloo, N. Y.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; died February 22.

Baker, William H., Pueblo, Colo.; School of Dentistry, University of Denver; died February 21; aged 56.

Belber, Leon M., West Philadelphia, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; died March 4; aged 62.

Bohm, Leo W., New York, N. Y.; College of Dentistry, New York University; died March 9; aged 61.

Brady, William Francis, Oneonta, N. Y.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; died March 3; aged 61.

Breckenridge, Charles, Chicago, Ill.; Dental School, Northwestern University; died March 9; aged 76.

Carpenter, William J., Jersey City, N. J.; College of Dentistry, Howard University; died February 23; aged 44.

Clewer, D.; died December 11; aged 53.

Collver, C. W., Clinton, Wis.; aged 87.

Conway, Thomas J., Springfield, Mass.; Tufts College Dental School; died March 7; aged 64.

Cope, Webster Z., Telford, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; died January 27; aged 57.

Dailey, William D., Harrisburg, Pa.; Baltimore College of Dental Surgery, University of Maryland; died February 21; aged 41.

Davies, William L., Miami, Fla.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; died March 1; aged 64.

Dawson, Roy B., Ridge, W. Va.; Baltimore College of Dental Surgery, University of Maryland; died February 19; aged 57.

Denne, Frederick Arthur, Stayner, Ontario, Canada; Royal College of Dental Surgeons; died December 25; aged 82.

Denton, A. M., Chicago, Ill.; Chicago College of Dental Surgery, Loyola University; died November 30.

Elder, John M., Houston, Texas; School of Dentistry, Washington University; died March 2; aged 56.

Elliott, F. S., Farmer City, Iowa; died January 26; aged 77.

Evans, Paul W., Hamilton, Va.; School of Dentistry, Georgetown University; died February 20; aged 70.

Floyd, Stanley T., Toronto, Ontario, Canada; Royal College of Dental Surgeons; died December 28; aged 69.

Fogg, A. R., Hanover, N. H.; Tufts College Dental School; died March 4; aged 54.

Freeman, R. J., Green Bay, Wis.

Gaffney, Thomas W., Seattle, Wash.; School of Dentistry, North Pacific College of Oregon; died February 25; aged 55.

Gallagher, Edward T., Alton, Ill.; School of Dentistry, Washington University; died February 12.

Garvin, Frederick Anthony, Oneida, N. Y.; School of Dentistry, University of Buffalo; died February 25; aged 66.

Gibson, W. J., Victoria, British Columbia, Canada; School of Dentistry, North Pacific College of Oregon; died December 28.

Giffin, B. B., Superior, Wis.; Dental School, Northwestern University; died December 4; aged 63.

Green, Edson M., Scranton, Pa.; Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania; died February 3; aged 78.

Jones, Ernest J., Norwich, Conn.; Baltimore College of Dental Surgery, University of Maryland; died February 28.

Keefe, James E., Chicago, Ill.; Chicago College of Dental Surgery, Loyola University; died in March; aged 82.

Knapp, Alvin, Brattleboro, Vt.; School of Dentistry, University of Michigan; died February 17; aged 86.

Lecher, Robert B., Nanticoke, Pa.; School of Dentistry, University of Pittsburgh; died March 5; aged 57.

Leggo, Frederick, Owatonna, Minn.; Dental School, Northwestern University; died February 9; aged 81.

Lynch, Arthur F., Providence, R. I.; School of Dentistry, University of Maryland; died February 16.

McIntyre, James M., Ottawa, Ontario, Canada; Royal College of Dental Surgeons; died December 15; aged 72.

McKain, John, Milwaukee, Wis.; died March 3; aged 38.

Manley, John T., immediate past president of the Baltimore Dental Society, died March 18, after an illness of several weeks. He was 48 years old. He was graduated from the University of Maryland Dental School in 1919.

Meusel, Herman C., Fond du Lac, Wis.; Cincinnati College of Dental Surgery; died February 20; aged 74.

Miller, Frederick, St. Charles, Ill.; Chicago College of Dental Surgery, Loyola University; died January 29; aged 59.

Murphy, Arthur M., Portage, Wis.; Dental School, Marquette University; died February 23; aged 46.

Pearse, Alfred H., Philadelphia, Pa.; School of Dentistry, Temple University; died February 24; aged 81.

Peterson, Ralph, Prairie du Chien, Wis.; Dental School, Marquette University; died December 3; aged 40.

Reiber, Frank J., Paw Paw, Mich.; Chicago College of Dental Surgery, Loyola University; died March 1; aged 71.

Rice, Will G., Sheboygan, Mich.; died February 4.

Richards, G. R. T., Arkansas City, Kan.; Dental School, Northwestern University; died in January.

Robichaux, L. F., San Antonio, Texas; Dental School, Northwestern University; died February 16; aged 71.

Russell, Daniel Edwin, Hamilton, Ontario, Canada; Royal College of Dental Surgeons; died December 1; aged 78.

Sumners, Albert V., Ottawa, Ontario, Canada; Royal College of Dental Surgeons; died December 17; aged 66.

Van Saun, Edwin V., Ridgefield, Conn.; College of Dentistry, New York University; died March 8; aged 75.

Verne, Paul Conrad, Moorhead, Minn.; School of Dentistry, University of Minnesota; died March 4; aged 59.

Walker, Donald C., Oil City, Pa.; School of Dentistry, University of Pittsburgh; died March 4; aged 50.

White, James, Tompkinsville, Ky.; School of Dentistry, University of Louisville; died February 28; aged 77.

MEETINGS AND ANNOUNCEMENTS

Meetings of State Societies

State	*Date*	*Place*	*Secretary*	*Address*
Alabama			A. M. Sellers	812 Empire Bldg., Birmingham
Arizona			R. D. McDonald	601 Valley Bk. Bldg., Mesa
Arkansas			I. M. Sternberg	Merchants Bk. Bldg., Ft. Smith
California			L. E. Linehan	450 Sutter, San Francisco
South. California	Sept. 16-18	Los Angeles	R. L. Borland	Rm. 615, 1052 W. 6th St., Los Angeles
Colorado			M. R. Markley	Republic Bldg., Denver
Connecticut	June 5-7	Hartford	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware			R. H. Stucklen	1003 Delaware Ave., Wilmington
District of Columbia			M. E. Colvin	1726 21st St., N.W., Washington
Florida	Nov. 11-13	Palm Beach	A. J. Fillastre	603 Marble Arcade, Lakeland
Georgia			R. H. Murphy	605 Bankers Ins. Bldg., Macon
Hawaii	Oct. 29-Nov. 3	Honolulu	J. H. Dawe	P.O. Box 39, Honolulu
Idaho	June 6-8	Boise	M. Kirkpatrick	Caldwell
Illinois	Sept. 16-19	Chicago	L. H. Jacob	Jefferson Bldg., Peoria
Indiana			E. E. Ewbank	Kingman
Iowa			A. N. Humiston	417 Higley Bldg., Cedar Rapids
Kansas			F. A. Richmond	1008 Huron Bldg., Kansas City
Kentucky			J. L. Walker	640 Barbee Way S., Louisville
Louisiana			J. S. Bernhard	407 Med. Arts Bldg., Shreveport
Maine	June 27-29	Portland	A. H. Garcelon	State House, Augusta
Maryland			P. A. Deems	835 Park Ave., Baltimore
Massachusetts			P. E. Adams	106 Marlborough St., Boston
Michigan			F. Wertheimer	Mich. Dept. of Health, Lansing
Minnesota			L.M.Cruttenden	498 Lowry Med. Arts Bldg., St. Paul
Mississippi			O. L. Colee	Magnolia
Missouri	May 12-14, 1947	Kansas City	C. W. Digges	Exchange Natl. Bk. Bldg., Columbia
Montana			F. E. Laing	401 Hart-Albin Bldg., Billings
Nebraska			F. A. Pierson	Fed. Securities Bldg., Lincoln
Nevada	June 8	Reno	R. Atkinson	503 Med. Dent. Bldg., Reno
New Hampshire	June 23-25	N. Conway	F. E. Williams	814 Elm St., Manchester
New Jersey			J. G. Carr	223 E. Hanover St., Trenton
New Mexico			J. S. Eilar	1st Natl. Bk. Bldg., Albuquerque
New York			C. A. Wilkie	1 Hanson Pl., Brooklyn
North Carolina			C. W. Sanders	Benson
North Dakota			F. A. Maides	Grand Forks
Ohio	Nov. 11-13	Columbus	E. C. Mills	220 S. Cassady Ave., Columbus
Oklahoma			E. Wise	Med. Arts Bldg., Tulsa
Oregon	June 13-15	Portland	W. H. Hurley	Selling Bldg., Portland
Panama Canal Zone			I. Buchin	Post Dent. Surgeon, APO 834, c/o PM, New Orleans
Pennsylvania			E. R. Aston	421 Market St., Kingston
Philippine Islands			G. A. Carreon	9 Broadway, 3rd St., N. Manila
Puerto Rico			J. O. Porrate	16 Caribe, Santurce
Rhode Island			C. F. McKivergan	102 Waterman St., Providence
South Carolina			P. B. Hair	701 Andrews Bldg., Spartanburg
South Dakota			E. W. Elmen	Sioux Falls
Tennessee			E. J. Justis	Exchange Bldg., Memphis
Texas			W. Ogle	313 Med. Arts Bldg., Dallas
Utah	June 8-10	Salt Lake City	M. G. Kuhre	Trib.-Tel. Bldg., Salt Lake City
Vermont			J. A. Larrow	Middlebury
Virginia			J. E. John	804 Med. Arts Bldg., Roanoke
Washington			F. J. Dingler	1502 Med. & Dent. Bldg., Seattle
West Virginia			M. H. Nicholson	321 Cal & Coke Bldg., Bluefield
Wisconsin			R. A. Mason	964 N. 27th St., Milwaukee
Wyoming	June 23-26	Sheridan	J. D. McNiff	Laramie

Meetings of State Boards of Dental Examiners

Arkansas	June 24-27	Little Rock	C. W. Koch	Donaghey Bldg., Little Rock

California	June 24 Aug. 5 Sept. 16	San Francisco San Francisco Los Angeles	K. I. Nesbitt	515 Van Ness Ave., San Francisco
Colorado	June 17-21	Denver	H. D. Stanwood	724 Republic Bldg., Denver
Connecticut	June 18-22	Hartford	C. G. Brooks	302 State St., New London
Delaware	June 19-21	Wilmington	C. R. Jefferis	Medical Arts Bldg., Wilmington
District of Columbia	June 17	Washington	H. A. Swanson	1726 Eye St., N.W., Washington
Maine	June 30-July 1	Augusta	C. W. Maxfield	Bangor
Massachusetts	June 17-19	Boston	J. C. Wilson	413 N. State House, Boston
Minnesota	June 17-22		E. E. Comartin	100 First Ave. Bldg., Rochester
Mississippi	June 18-20	Jackson	W. R. Madden	Forest
North Dakota	July 8-11	Fargo	R. Krause	Bismarck
Ohio	July 22-24 (practical) July 23 (dental hygienists) July 25-27 (theory)	Columbus	E. D. Lowry	70 E. State St., Columbus 15
Oklahoma	June 24-27	Oklahoma City	W. T. Longwell	1st Natl. Bk. Bldg., Frederick
Tennessee	June 10-14	Memphis	J. J. Vaughn	Medical Arts Bldg., Nashville
Texas	June 17-24	Dallas & Houston	C. C. Hardin	Norwood Bldg., Austin
Vermont	June 24-26	Montpelier	C. I. Taggart	139 Bank St., Burlington
West Virginia	June 24-27	West Liberty	R. H. Davis	Clarksburg
Wisconsin	July 8-12	Milwaukee	S. F. Donovan	Tomah

Other Meetings

Name	*Date*	*Place*	*Secy. or Chm.*	*Address*
American Association of Orthodontists	Sept. 30-Oct. 3	Hotel Broadmoor, Colorado Springs	Max E. Ernst Secy.	1250 Lowry Med. Arts Bldg., St. Paul
National Dental Association	Aug. 19-23	Louisville	J. A. Jackson Secy.-Treas.	Charlottesville, Va.
Western Reserve Dental Alumni Association	June 12	Cleveland	C. F. Tuma	13201 Miles Ave., Cleveland
Dental Alumni Society, University of Pennsylvania	June 7	Philadelphia	Z. T. Jackaway Secy.-Treas.	1506 Susquehanna Ave., Philadelphia
Dental Alumni Association, University of Pittsburgh	June 11	Pittsburgh	H. E. Friesell Dean	Thackeray & O'Hara Sts., Pittsburgh
Wisconsin Dental Economic Study Club	Aug. 23-24	Madison	L. R. McCormick Publicity Chm.	2609 University Ave., Madison

Internships, Externships, Residencies and Fellowships

The Children's and Infants' Hospital (a Unit) of Boston. Address Paul K. Losch, 300 Longwood Ave., Boston.

The Children's Memorial Hospital, Chicago. Administrator, Mabel W. Binner, 707 Fullerton Ave., Chicago.

Eastman Dental Dispensary, Rochester, N. Y. Director, Harvey J. Burkhart.

Fellowships for Research and Graduate Work in the Dental Sciences, University of Rochester. Dean, George H. Whipple.

International Grenfell Association, Staff Selection Committee, 56 Fifth Ave., New York City.

Jewish Sanitarium and Hospital for Chronic Diseases. Director, Leonard Kohn, Dental Division, East Forty-Ninth St. and Rutland Road, Brooklyn 3, N. Y.

Joseph Samuels Dental Clinic of the Rhode Island Hospital, Providence. Director, Ernest A. Charbonnel.

Research and Educational Hospital, University of Illinois Medical Center. Dean, College of Dentistry, University of Illinois, 808 South Wood St., Chicago 12.

Richmond Freeman Memorial Clinic for Infants and Children, Dallas, Texas. Executive Director, Dora B. Foster, 3617 Maple Ave., Dallas.

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222 East Superior Street, Chicago 11, Illinois
Telephone: WHItehall 6730 Cable Address: ADAECO

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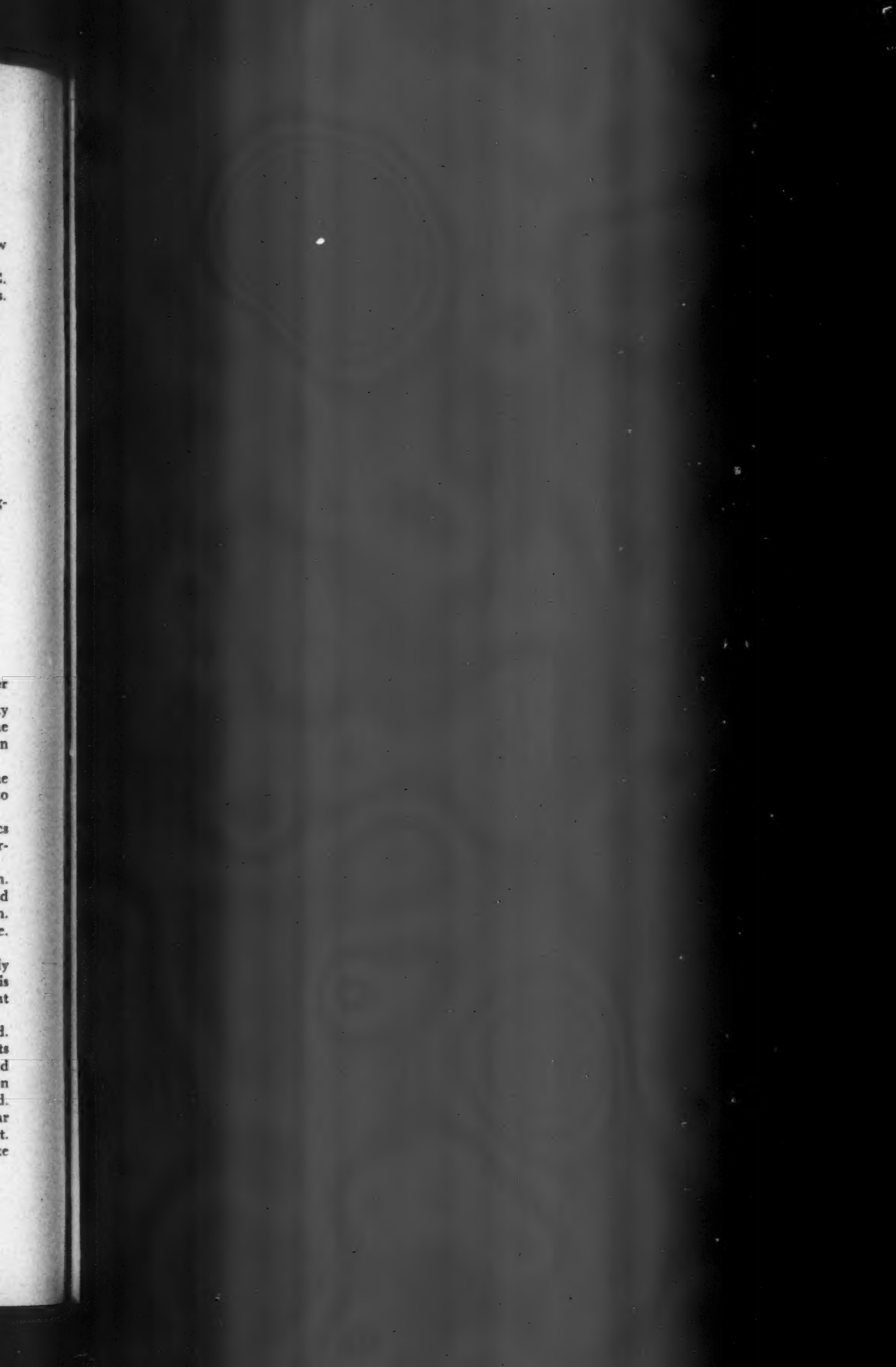
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